

OFFSHORE HYDROCARBON PRODUCTION

HEARING BEFORE THE COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE ONE HUNDRED NINTH CONGRESS

FIRST SESSION

TO

DISCUSS THE CURRENT STATE OF OUR NATION'S OFFSHORE ENERGY PRODUCTION AND THE RECENT TECHNOLOGICAL ADVANCEMENTS MADE IN THE EXPLORATION AND PRODUCTION OF TRADITIONAL FORMS OF ENERGY, STEPS THAT THE OFFSHORE OIL AND GAS INDUSTRY HAS TAKEN TO ENSURE WORKER SAFETY AND TO MEET ENVIRONMENTAL CHALLENGES, THE WAYS IN WHICH THE FEDERAL GOVERNMENT CAN FACILITATE ADDITIONAL EXPLORATION AND PRODUCTION OF RESOURCES IN THE OUTER CONTINENTAL SHELF WHILE ENSURING WORKER SAFETY AND THE MAINTENANCE OF ENVIRONMENTAL INTEGRITY, AND NEW APPROACHES TO HELP DIVERSIFY THE ENERGY MIX ON THE OUTER CONTINENTAL SHELF

APRIL 19, 2005



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OFFSHORE HYDROCARBON PRODUCTION

TUESDAY, APRIL 19, 2005

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The committee met, pursuant to notice, at 10:05 a.m., in room SD-366, Dirksen Senate Office Building, Hon. Pete V. Domenici, chairman, presiding.

OPENING STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM NEW MEXICO

The CHAIRMAN. Thank you, everyone, for being here. I think it should be pretty obvious to everyone that we cannot possibly mark up an energy bill and take it to the floor without a clear understanding of the current situation with reference to offshore oil and gas production and its current limitations. The gas industry is a tremendously important one now and obviously will continue into the future.

The question will be: Are there any significant changes that can be made so as to make those assets even more important to America in the future? So as we consider the state of oil and gas production on the Outer Continental Shelf and the technological advancements made in offshore exploration and production, we are going to hear testimony on the emergence of renewable sources of energy, such as wind, wave, tidal and ocean thermal along with it that is in the OCS.

We are going to look at what the Federal Government might do to advance that renewable project in the OCS. Oil and gas production amounts to approximately 1.7 million barrels of oil per day and 12.5 billion cubic feet of natural gas per day. Annually, this production equals approximately 600 million barrels of oil per year, 4.7 trillion cubic feet of natural gas per year.

These numbers amount to about 30 percent of our U.S. domestic oil production and 23 percent of our domestic natural gas production. It is estimated that by next year production of OCS will amount to 40 percent of domestic oil production and 25 percent of the domestic natural gas production. Now that is not singularly or solely from offshore or—this is a living—this is the reality of America's onshore production having peaked out and coming down.

With respect to the natural gas in the Gulf, this is a—it is failing to maintain its level of contribution to domestic natural gas supply. In fact, the natural gas production has fallen off in 1997 from its peak of 5.1 trillion cubic feet down to 4.7. Rather than decrease, I wish there was some politically acceptable way that the OCS pro-

duction would increase. And I will be watching and listening and reviewing the suggestions made by the Senator from Tennessee, Senator Alexander, and his natural gas bill. He appears to have some very exciting proposals for this resource.

In 2004, the United States consumed 20 million barrels of oil a day. In 2025, the United States is predicted to require 27.9 million barrels a day. I think it makes more sense from an economic and environmental perspective to meet that consumptive demand through domestic production, if we can, and with increasing our reliance upon imported natural gas or crude oil.

However, I am pragmatic about the politics and realize how challenging the position is. Nonetheless, I am more than willing to address it if the committee wishes to address it.

Our witnesses today will share their diverse views on these challenges. And we thank them in advance for being here today and for giving us their time and their expertise.

Senator Bingaman, do you have an opening statement that you would you like to give now?

[The prepared statement of Senator Talent follows:]

PREPARED STATEMENT OF HON. JAMES TALENT, U.S. SENATOR
FROM MISSOURI

Mr. Chairman, Thank you so much for holding this hearing and thank you to our witnesses for their testimony today.

We are facing an energy crisis and we need to take quick action to address a problem that has been decades in the making. I realize that we need a balanced, comprehensive approach to energy policy which includes conservation and improved technologies, but we can't ignore that there is something fundamentally wrong with our energy policy.

Our country has contradictory policies on natural gas—on one front, we encourage its use. On the other front, we limit access to its supply. We must amend our country's contradictory policy on natural gas access.

For example, U.S. natural gas consumption is expected to grow from 22 trillion cubic feet (tcf) in 2003 to almost 31 tcf in 2025. Domestic production, however, is predicted to grow from 19.1 tcf to 21.8 tcf, meeting only about 30 percent of projected growth demand.

We have a tremendous supply of oil and gas just off our shores, but we can't touch it. The economy is suffering because of the decisions we've made regarding domestic energy reserves.

Everyone agrees that the OCS holds the greatest potential for development, but approximately 85% of lower-48 state OCS acreage is off-limits to leasing activities. At the same time, Canada and other countries are not hindered by these same regulatory burdens. They have access to these resources and they are taking advantage of our moratorium.

Sen. Alexander has done a tremendous job looking at the state of the natural gas industry and I support his efforts. He has worked tirelessly and developed an extremely comprehensive bill that strives to strike a balance between conservation and increased supply.

I strongly support the concept of additional state authority on the outer continental shelf. It seems clear to me that these states should be able to decide what is best for their coastline, not the federal government.

I support Sen. Alexander's bill and I will continue work with him to support finding a workable solution that address both the demand and supply side of the equation.

STATEMENT OF HON. JEFF BINGAMAN, U.S. SENATOR
FROM NEW MEXICO

Senator BINGAMAN. Thank you very much, Mr. Chairman.

Thanks for calling this hearing. I want to first welcome Admiral Watkins back before the committee. He has made many contribu-

tions to this country and this government in many different capacities. I understand he is here now as the Chairman of the U.S. Commission on Ocean Policy, which I think his expertise will be very valuable to us.

I know that the other witnesses are also extremely capable, and I look forward to hearing from them. Thank you.

The CHAIRMAN. Thank you very much.

Senator Alexander, I understand you would like to make a statement. And you are welcome to do so. Do not cut it short, whatever you would like to say. You have been working hard on this issue.

**STATEMENT OF HON. LAMAR ALEXANDER, U.S. SENATOR
FROM TENNESSEE**

Senator ALEXANDER. Well, thank you, Mr. Chairman. I want to thank you for having this hearing. And what I wanted to do, and I can summarize it, is to mention the proposal that Senator Johnson and I made in our natural gas legislation that has to do with what happens offshore. I mean, we have \$7 natural gas in this country, which is hurting blue collar workers. It is hurting farmers. It is hurting homeowners. And with the encouragement of Chairman Domenici, Senator Johnson and I have put together a comprehensive natural gas bill to try to address this aggressively on all fronts to see if any of these ideas might be useful for the energy bill as it comes along.

So we were aggressive on conservation and aggressive on alternative fuels, aggressive on research and development, aggressive on importing liquified natural gas, and also on supply. And as Chairman Domenici said here and as he said last year on the floor, if you address supply and do not address offshore supply, you are not addressing supply.

So what we have tried to do is to think of environmentally sensitive ways to take more advantage of natural gas supply offshore as a way of bringing down the \$7 price. This comes from a Senator who supports mandatory caps on carbon.

So we—and, Senator Domenici, what I wanted to do was mention in a sentence or two the three areas that are in this bill, so that if any of the witnesses want to comment on it, they could. I will also ask questions about it.

The first proposal was to permit the Department of the Interior to issue natural-gas-only leases. A State might find it easier to work with such a lease, not deal with the possible environmental problems that may come from oil.

The second proposal was to instruct the Secretary of the Interior to draw the State boundary between Alabama and Florida out into the ocean. We call this lease 181. If it is in Alabama, it would be leased. If it is in Florida under the current moratorium and rules, it would not.

And the third is to create a way that the Governor of, say, Virginia, whose legislature recently acted a similar way, that they could find out whether they have gas offshore, decide whether they wanted to lease it and give them a share of the revenue. And that proposal is in the legislation, but basically it allows the Governor to write, on behalf of the State and the Secretary of the Interior, and say: May we have an inventory of what is offshore? He is try-

ing to get one for the whole inventory, but—and then an explanation of the planning process.

And the Secretary would then provide that to the Governor. The State would then decide what it wanted to do. If Virginia wanted to put a gas-only rig 20 miles offshore, further than they can see it, and use the revenues to improve its university system or reduce its taxes, it can do that.

There would also be a conservation royalty on top of that that would go to conservation purposes all across the country. And adjacent States could veto it, if they could see it.

So that is the idea. And it is a different way of approaching it. But I—one thing, Mr. Chairman, as these tens of thousands of jobs move overseas and as farmers' prices go higher and as home heating and cooling prices go higher, somebody is going to ask us: What did you do to increase the supply of natural gas?

And if we do not deal with offshore gas, I do not see, as well as conservation research and development, alternative fuels and liquified natural gas, I do not see that we are doing our job properly.

Thank you for your time.

The CHAIRMAN. Senator Alexander, before you stop addressing, could I just inject a question and could you answer it with reference to in your legislation or what you—what about offshore production of renewable energy, like wind? Can you address it? What is the current status, I guess is the real question.

Senator ALEXANDER. Well, we felt that—the current status is that it is confused.

[Laughter.]

Senator ALEXANDER. But it is offshore. It is not clear who is in charge of what. The current status also is—and, you know, I care about visual pollution. I do not want to see a gas rig. I do not want to see 46 square miles of windmills that are 100 yards tall either.

So one area we might want to address, and maybe our witnesses can help us with it, is: How could we make it clear who is in charge of that?

There are also, so far as I can find, no real clear rules about what to do about highly scenic areas offshore, how they might be protected. And perhaps that is part of our responsibility. The short answer is we do not try to clarify that situation offshore in our bill.

The CHAIRMAN. Okay. Now I understand that Senator Landrieu would like to comment. And I think that both Senators on this side would like to also.

STATEMENT OF HON. MARY L. LANDRIEU, U.S. SENATOR FROM LOUISIANA

Senator LANDRIEU. Thank you, Mr. Chairman. Just briefly, I would like to follow up on some of the things that the Senator from Tennessee mentioned. But before I do, let me just thank you, Mr. Chairman, for calling this very important hearing, because this issue is going to be a crucial piece and a foundation, really, for our energy bill. And I think the testimony that we are going to receive this morning is going to be extremely helpful on that line.

On the second panel, we are pleased to have Scott Angelle, who is the Department Secretary of Natural Resources from Louisiana,

a former parish president, a real expert on the subject. And I am really happy that our committee could have such a man testify this morning on a subject that is so important.

Mr. Chairman, thank you for visiting Louisiana, for flying out to an offshore rig, for standing on the beaches and the barrier islands of Louisiana and really getting a firsthand look at the situation that exists today in the Gulf, which is extremely promising. And so much progress has been made.

I want to thank Senator Bingaman for doing the same, for flying over the largest coastal wetland in the United States, seeing the oil and gas production, and how things are managed well and wisely. We can create jobs, preserve the environment, and create prosperity and wealth and, most importantly in this time and age, economic security and military security for our nation.

I want to just begin by saying that I guess in the last 200 years the country has become very comfortable with the focus on the Western frontier. It is really what, you know, manifest destiny and the concepts of that frontier and the West meant to the development of our country.

I think we sit on the beginning of looking at our oceans as a new frontier. And of course, we have space as an additional frontier, physical frontiers. There are others. Technology is in a different category. But I would like us to think, as we begin this hearing this morning, of this great frontier that is our ocean, as our Outer Continental Shelf, and ways in which in this energy bill we could lay down policies that respect that frontier but put the resources that are available there to work for the American people and for the world in general, and having the right balance between developing that frontier and preserving that frontier.

When we think of Louisiana, of course we know that Louisiana, Texas, Mississippi, and Alabama have probably experimented more with that concept than any State in the Union. Not only do we have offshore oil and gas production, but we are also a robust fisheries. We have commercial shipping through these channels, inland waterways, fishing, all sorts of economic activities that have benefited not just our States, Mr. Chairman, but the entire Nation and, I would say, the world.

And so we have also known over the course of our using this great frontier, which is the Outer Continental Shelf, there have been some mistakes made. But having the benefit of hindsight, having the new technologies that are in place, can help us to lay out a plan for using this great frontier to the benefit of our Nation.

Just two points in particular: The OCS, the Outer Continental Shelf, has generated \$145 billion for the U.S. Treasury since offshore oil and gas production began. It is the second biggest contributor of revenue to the Federal Treasury after the income tax. This is not pocket change. It is not money that can be left on the table.

America is desperate for revenues and resources. And if we do this correctly, we can provide riches and investments for our nation.

One comment about the environment: I understand the history, as many of us do, with the terrible spill that occurred—Senator Feinstein is here—off the coast of California and how so much of

this regulatory regime came into place. And I am aware of the dangers associated with offshore oil and gas drilling.

But I will say that from 19—the new technologies that exists today are not your grandfather's technologies. 97 percent of offshore oil spills were less than one barrel or less in volume. From 1985 to 2001, pipelines accounted, Mr. Chairman, for only 2 percent of the oil released in U.S. waters. There is more oil released from underground natural reserves of oil and gas than there is from our pipelines or from our OCS activity. Now having said that——

The CHAIRMAN. From seepage.

Senator LANDRIEU. Seepage. I am sorry. Natural seepage.

Having said that, I am aware that the politics is very different across the country. And as I look at my colleagues and I want to work with them to try to find the appropriate ways that are sensitive to the different regions. I am confident, Mr. Chairman, with your leadership and Senator Bingaman, that we can find a way to use these resources in a responsible way, to be good stewards of our oceans, invest back some of these billions of dollars in protecting and enhancing our environment for future generations and create jobs for the here and the tomorrow.

Thank you.

The CHAIRMAN. Thank you very much.

Senator Martinez.

STATEMENT OF HON. MEL MARTINEZ, U.S. SENATOR FROM FLORIDA

Senator MARTINEZ. Mr. Chairman, I want to thank you and the ranking member for holding this very important hearing.

And I would like to have my full statement be part of the record.

The CHAIRMAN. It will be made part of the record.

Senator MARTINEZ. Thank you. I would like to make a few comments, I think, that would be helpful. As the new Senator from the State of Florida, I follow in the footsteps of former Senators Connie Mack and Bob Graham, as well as my Senate colleague, Senator Bill Nelson, as well as our Governor Jeb Bush and almost, I would say, the entire Florida delegation, in my firm opposition to drilling off Florida's coast.

You know, Mr. Chairman, every State has differences, and every State has their own unique situation. And Florida's is certainly driven by what is in our State our No. 1 economy, which is tourism, the fact that people come to our State by the millions, 58.9 million in the most recent years, to come to our State to enjoy its wildlife, its natural beauty, its privileged climate, as well as amusement parks and other amenities.

The tourism industry alone directly employs nearly 840,000 Floridians and provides an economic impact of about \$47 billion a year for our State's economy. For the 58.9 million visitors, a great many of them come to Florida to enjoy the pristine coastline and the wonderful climate. And they return year after year to their favorite vacation spots to relax under our skies, as well as the beautiful beaches and the wonderful waters off our coast.

And our appreciation for this very unique ecosystem in which we live in Florida is a combination of the Atlantic coast, the Gulf of

Mexico, and then these vast areas of inland wetlands that all work together to create this complex ecosystem.

And the reason I bring up these facts is to just share a concern of the people of Florida that drilling off of our coast, the need that there is for furthering the sources of energy for our country's security and for the cost that it represents and the burden that it is on people, that the solution to that does not rest on Florida's coastline. We are adamantly opposed in Florida to oil and gas exploration on our coastal waters.

It is something that has become clearly entrenched as a Floridian point of view. I understand it differs from those of our other Gulf coast neighbors. But it is one that I think nonetheless ought to be strongly expressed in this committee.

As we seek solutions to energy independence, to the issues of cost, please be assured that the people of Florida do not wish for there to be oil exploration off of our coast. And it is something that there is a fairly strong consensus of opinion by the leadership of our State, shared by both parties, that this is just simply off limits, that our coastline ought to be maintained and ought to remain as the pristine coastline that it is today.

I thought it was important—and I appreciate the entire statement going into the record—but I thought it important to express our strongly held point of view. I realize that as technologies change, that there may be a temptation to view things differently. The people of Florida do not. The people of Florida want to continue to maintain the very strong position in opposition to drilling off of Florida's coast, and also, of course, as we define that coast to be.

So thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much.

[The prepared statement of Senator Martinez follows:]

PREPARED STATEMENT OF HON. MEL MARTINEZ, U.S. SENATOR FROM FLORIDA

Mr. Chairman, I am pleased to attend today's hearing and listen to our witness panel discuss an issue that is of great concern to Floridians—the development of offshore energy resources.

I follow in the footsteps of former Senators Connie Mack and Bob Graham as well as my Senate colleague, Senator Bill Nelson, our governor Jeb Bush, and almost the entire Florida congressional delegation in my firm opposition to drilling off Florida's coasts.

Every year roughly 58.9 million people visit the Sunshine State to enjoy its beautiful beaches, exciting amusement parks, and wonderfully abundant wildlife and natural splendor. The tourism industry alone directly employs nearly 840,000 Floridians and provides an economic impact of \$46.7 billion to our state's economy. Of the 58.9 million visitors, a great deal come to Florida to enjoy its pristine coastline and wonderful climate. Families return, year after year, to their favorite vacation spots to relax under our brilliant blue skies, powdery white beaches, and crystal-clear emerald waters. The people of Florida share a love and appreciation of the Atlantic Ocean and the Gulf of Mexico, its coastal habitat, and our wetlands which make it a very complex ecosystem; and a very special place to live.

I share these facts, for one reason: the people of Florida are concerned that their coastal waters are coming under increased pressure to exploit its possible oil and gas resources. The people of Florida do not want that to happen.

Floridians are adamantly opposed to oil and gas exploration off its coastal waters. They have serious concerns that offshore drilling will increase the threat of potential oil spills, seriously damaging and threatening marine wildlife and their coastal habitat.

In addition, Floridians are extremely concerned that drilling operations would produce massive amounts of waste mud and drill cuttings that would be generated and then sent untreated into the surrounding waters.

Our fears are by no means unfounded. We have seen what has happened to the beaches of Texas and Louisiana as a result of offshore drilling in those states.

I am in no way making light of the energy crisis we are facing in this country.

Over 90 percent of all new power plants are being fueled by natural gas.

Currently, our nation relies on coal for 52 percent of our nation's electricity generation. By far, this is our cheapest and most abundant energy source, with enough domestic supply to meet our country's electricity needs for the next 250 years. However, we must continue to fund new technologies that will address the impacts this abundant resource has on our environment. We must provide long-term incentives for other renewable energy sources, like solar and wind energy, as well as promoting new technologies like coal gasification and carbon sequestration.

Mr. Chairman, the time for action on a national energy policy is now.

Without a comprehensive energy policy that adequately examines and addresses our energy and conservation needs, we will remain in this frustrating and increasingly expensive situation. According to the Energy Information Administration, Florida is the third largest energy consuming state in the country; consuming 20.8 million gallons of oil a day.

We must have a more balanced energy portfolio that also focuses more federal resources on renewable energy sources, which currently make up about 6 percent of nation's energy consumption. There are other promising new discoveries through research and development that could also reap environmental benefits for my state, like desalination, that will reduce our dependence on groundwater in my fast growing state.

I will say Mr. Chairman, that I look forward to working with you and Senator Bingaman to reach a bipartisan solution to our energy problems.

There is much work to do, but we must work to solve our nation's energy problems without looking to Florida's coasts. They are not open for consideration.

The CHAIRMAN. Senator Burr.

STATEMENT OF HON. RICHARD BURR, U.S. SENATOR FROM NORTH CAROLINA

Senator BURR. Thank you, Mr. Chairman. And, Mr. Chairman, I thank you and Senator Bingaman and your staff for a very open process, one that I think has looked at all options that might be incorporated. And those talks continue. And I do not think that we could ask for any more than what you have provided.

I have the distinct honor or the curse of being, I believe, the only member here who has drafted, debated, and voted on twice in the House of Representatives an energy bill. As Vice Chairman of the Energy and Commerce Committee, we voted out of committee 2 years ago a bill that I believe will be very close to what we mark up hopefully in this committee.

One of the issues that the House did not include was an inventory of potential oil and gas reserves in the Outer Continental Shelf, areas designated to be under the moratorium for drilling. The issue of prohibiting drilling off the coast of North Carolina has been active for the past three decades and one that has transcended political parties. Local, State, Federal Government officials, environmentalists, property owners, conservationists, and fishermen, overwhelmingly they have shared the view that the moratorium in North Carolina should be honored.

When developing my position to support exploration in ANWR, I took into account the local communities closest to ANWR, who overwhelmingly supported exploration. I also took into account the support of the Alaskan State House and Senate, as well as the support of the last two governments, Democratic and Republican, for exploration.

And I took the Alaskan congressional delegation's support for ANWR into consideration when deciding to support exploration there. I used the same rationale, but came to a different conclusion while formulating my opinion to support the OCS moratorium off the coast of North Carolina. This is not a view that I developed over the past 12 months, even though North Carolina's Fifth Congressional District was landlocked.

I heard from a number of my constituents who either vacationed or owned property on the Outer Banks about their support for a moratorium. Over the course of deliberating two energy bills in the House, I came to a better understanding of the views of our General Assembly, the past three Governors, Democratic and Republican, in support of the drilling moratorium.

I came to a better understanding of the support for a moratorium within our State's congressional delegation and the support of Senator Dole and my two predecessors in this seat, Republican and Democrat. In fact, it was former Senator Lauch Faircloth, a Republican, who successfully lobbied President Clinton, to have North Carolina added to the moratorium list in late 1990.

Taking all these views into consideration, I came to the conclusion that the moratorium off the coast of North Carolina should be honored as long as North Carolinians remained in the overwhelming support of such restrictions. As I stated earlier, this is a view that has evolved over time and one that I came to when natural gas was cheaper and more readily available.

Now we find ourselves in a time when the demand for natural gas is at an all-time high and domestic supply is stretched thin. The promise of importing liquified natural gas must be tempered with the reality that these imports will most likely come from regions of the world with the greatest political unrest.

So in light of this challenge, I do not want my support for the moratorium to preclude other States from reviewing their inclusion in the OCS moratorium. I will take under consideration any proposals that incorporate the idea that each State wishing to review and possibly repeal its inclusion under the moratorium be given that opportunity.

But let me make clear this one point: I will have serious reservations about any legislation or amendment that repeals or compromises the OCS moratorium before a State has taken action to request the inventory of its prohibitive offshore waters. Some of the proposals I have reviewed would lift the moratorium before a State had a chance to take the appropriate steps to request an inventory of its resources.

Any moratorium repeal should only be triggered after the appropriate State officials have made the formal request of an appropriate Federal agency that an inventory be conducted. Endeavors like these can only be successful if they are done in a bottom-up process that incorporates the support of local, State, and Federal Governments, in conjunction with property owners, conservationists, outdoor enthusiasts, in an open and inclusive process.

That is why they call this a groundswell of support. Any approach that advocates a top-down, one-size-fits-all approach is doomed for failure, I believe, and leaves us nowhere closer to addressing the overwhelming challenge of the energy crisis.

Mr. Chairman, I look forward to working with you and the rest of my colleagues. We may hold a very specific belief in North Carolina. But I do believe that States should have the ability on their own to make determinations about how they should proceed here. And I appreciate the Chairman's willingness to let me clarify my statement on this. And I yield back the time.

The CHAIRMAN. Well, I really appreciate your observations and your conclusion. I think your contributions to this committee are going to reflect the fact that you have spent a lot of time and a lot of effort in this area from your immediate past life in the House. And we are glad to have you on board.

Senator BURR. Thank you.

The CHAIRMAN. Senator Feinstein. First, let me suggest, if you do not mind, Senator, I made this rather generous decision to let you all speak when there were only three of you present.

[Laughter.]

The CHAIRMAN. As more of you have arrived, my generosity is changing.

[Laughter.]

The CHAIRMAN. Nonetheless, I certainly would not discriminate, Senator.

STATEMENT OF HON. DIANNE FEINSTEIN, U.S. SENATOR FROM CALIFORNIA

Senator FEINSTEIN. I appreciate that, Mr. Chairman. And let me just say that I think Florida and California have a similar point of view here. And I very much appreciate the comments from the Senator from Florida.

I want to just point that with respect to California, we are adamant on maintaining a moratorium. Governor Schwarzenegger has publicly opposed offshore drilling. He has called for the Federal Government to buy back the remaining 36 undeveloped Federal offshore oil and gas leases from the Outer Continental Shelf off the coast of central California.

California's Resources Secretary Mike Chrisman, the Secretary of the California Environmental Protection Agency Alan Lloyd, and the Lieutenant Governor have all been on record opposing any effort to lift the congressional moratorium on offshore oil and gas leasing activities.

As someone earlier pointed out, we are all too familiar with the consequences and what happened in 1969. And I think Californians—and I think Floridians possibly share this—really believe that a healthy coast is vital to a healthy economy and to our quality of life. We also believe that the oceans are a unique preserve. And they should be kept that way.

And there is already tremendous oil and gas production on the Outer Continental Shelf amounting to approximately 1.7 million barrels of oil a day, 12.5 billion cubic feet of natural gas a day. Annually the production equals approximately 600 million barrels of oil per year. That is 30 percent of U.S. domestic production. And 4.6—4.7 trillion cubic feet of natural gas a year.

According to the Minerals Management Service, activity on the Outer Continental Shelf has produced approximately 15 million barrels of oil and more than 155 trillion cubic feet of natural gas.

The estimate is that by 2006 this will be 40 percent domestic oil and gas. I think we really need to protect our Outer Continental Shelf.

There are so many things that are happening that I see that are carried in scientific journals that really worry me tremendously. And this is a very unique preserve. And we ought to preserve it as much as we can. But I can tell you this: Californians feel very strongly about the moratorium. And I think in this instance Florida and California will mount a real challenge to any effort to remove that moratorium.

Thank you very much.

The CHAIRMAN. You did not comment on what you would like to happen for other States. And I will not ask you at this point.

Senator FEINSTEIN. I agree, I think individuals States should play a role in this.

The CHAIRMAN. Good.

Senator FEINSTEIN. I think, for example, my colleague, Senator Landrieu, and I are really poles apart on this. And Louisiana may have very different needs than California does. But I think, too, the Outer Continental Shelf is, you know, not close to land. And it represents a unique challenge of how we come together as people from States in a Federal Government. I do not have all the answers to that.

The CHAIRMAN. Thank you very much.

The Senator from Alaska. Again, you do not have to have any comments, but we welcome them.

STATEMENT OF HON. LISA MURKOWSKI, U.S. SENATOR FROM ALASKA

Senator MURKOWSKI. Well, I cannot resist, Mr. Chairman. So thank you for your indulgence. And I am most appreciative of the comments from my colleagues very clearly stating the positions from their States, because I think it is important to this debate that we know where the individuals, where the residents come down when it comes to drilling off of their coast. And we do need to listen to their opinions. We do need to pay attention.

I am appreciative of the fact, Mr. Chairman, that we are holding this hearing this morning on OCS energy development nationwide, but not just on oil and gas but also on the renewable forms of energy that can be produced off the coast. When it comes to the oil and gas, we know that the administration is now in its final process of looking at what areas to even consider for possible oil and gas leasing between 2007 and 2012.

And when we look at the estimates that are out there, 50/50 chance that there is 76 billion barrels of oil, 406 trillion cubic feet of conventional gas in the OCS, at this point in time we are looking at a domestic energy shortage and incredibly high prices, I think it makes sense for us to look at whether the technological conditions have changed to permit environmental safe extraction of oil and gas from the offshore areas.

The Senator from California has made reference to the incident off Santa Barbara in 1969. I would like to think that since 1969 we have made advancements to our technology, so that we can prevent incidents and accidents like that from ever happening again.

We are very mindful of the environmental issues relating to oil production and, to a lesser extent, to the gas production, the integrity of the ocean pipelines to carry the oil, the ability of leak detection systems to work to stop the leaks in the event of a pipeline leak, some of these things that might mitigate against development in some high valued areas.

Alaska has a microcosm in this debate. We have a number of basins off of our 33,000 miles of coastline that may contain oil and gas. We are currently estimating that Alaska's OCS may hold up to 40 billion barrels of oil and 220 trillion cubic feet of gas in our 6 main lease areas. But for various reasons, whether it is a valuable commercial fisheries, whether it is the difficulty of development in northern icing conditions, we do have a Presidential moratorium in one of our potential lease areas and partially restricted in two other areas.

We have potential up there. I mentioned the renewables. I just got an opportunity to sit and listen to proposals to generate power from ocean current generators and from offshore wind generators. So there are some ideas that are flowing around that are worthy of exploration.

Some of the issues about revenue sharing that I know my friend from Louisiana has raised, you experience a great deal of impact to your State as a result of leasing and drilling off your areas, and yet the return to your State, we have talked about the inequity there. And that is something that needs to be addressed, needs to be looked at.

If we were to have offshore development off of Alaska's coast, we would not be seeing the same revenue sharing that we currently enjoy from our onshore. So there is inequity there that needs to be addressed. And I look forward to doing that with you, Mr. Chairman and members of the committee.

Thank you.

Senator FEINSTEIN. Mr. Chairman.

The CHAIRMAN. Thank you very much, Senator Murkowski.

Senator Feinstein.

Senator FEINSTEIN. I neglected to do something. And Admiral Watkins is, I think, one of the most respected people I know. He was Chief of Naval Operations when I was mayor.

He has done so many fine things in his life. And I have not seen him for a while. I have the greatest respect for him.

And I just wanted to say welcome. It is great to see you.

Admiral WATKINS. You should know, Mr. Chairman, that Mayor Feinstein and Admiral Larkins, when I was Commander in Chief of the Pacific Fleet, came together and we brought the Navy back to San Francisco. It had disappeared after World War II. And we brought it back, did we not, Dianne?

Senator FEINSTEIN. That is right.

The CHAIRMAN. Well, I would assume that today's mayor of San Francisco could not bring the Navy back to San Francisco.

Senator FEINSTEIN. We will not get into that.

The CHAIRMAN. We will not get into that.

[Laughter.]

The CHAIRMAN. Even with your tremendous power, I do not know that that would be possible. In any event, that is enough from me.

[Laughter.]

The CHAIRMAN. Now we have to get to you-all. Frankly, I thought it was good that we let the Senators talk about this issue, because it is volatile, but it is big, important.

And we would like to hear from you, Admiral Watkins. I did not say anything at the beginning, but you already know what I know about you and what I think about you. My respect for your public service is just immeasurable.

So with that, I do now want to tell you that I will do exactly what you think about our offshore resources, but I am sure we will all be interested in what you think.

**STATEMENT OF ADMIRAL JAMES D. WATKINS, CHAIRMAN,
U.S. COMMISSION ON OCEAN POLICY**

Admiral WATKINS. Thank you, Mr. Chairman, members of the committee. I am pleased to be here today with you in my capacity as the Chairman of the U.S. Commission on Ocean Policy, to discuss Outer Continental Shelf energy-related recommendations and the Commission's final report, which I have here in front of me, if I can lift it, "An Ocean Blueprint of the 21st Century."

Before I proceed, I would like to briefly summarize the Commission's core recommendations, which should help put my comments in the proper context.

There is virtually universal agreement that our oceans are in trouble. And the current governing system is poorly structured to address the complicated cross-jurisdiction, ecosystem-based problems we are facing. In our final report, the Commission recommends a new approach to the national ocean policy that focuses on the transition toward ecosystem-based management, a process that will require changes in three major areas, and one with which all stakeholders agree. That is, the administration, Congress, Governors, and the public.

So first we need to create a new national ocean policy framework to streamline and improve how the government makes and implements decisions that must be horizontally integrated across multiple agencies, multiple legislative committees, and the States.

Concurrently, we need to strengthen science and generate high quality, credible, accessible information, particularly that emanating from the new Global Earth Observing System Initiative now committed to by the Administration. This will require support for basic and applied research, as well as the development of new sensing and observing technologies and a capacity to manage and fully utilize the huge amount of data that is being generated by these systems.

And finally, we need to greatly enhance ocean education to inspire the current and future leaders and citizens to adopt a strong stewardship ethic. Knowledgeable citizens and policymakers will be the driving force behind this new approach to ocean and coastal management. And progress is needed in all three areas if we are to have a comprehensive national ocean policy.

Let me now focus on the Commission's recommendations related to Outer Continental Shelf energy management. As Congress considers expanding energy-related activities in Federal waters, it should reevaluate current management regimes and consider how

to coordinate the growing sweep of activities in these areas. The Nation's vast offshore ocean areas are becoming increasingly appealing places to pursue economic activities, such as wind farms, agriculture, eventually bio-prospecting. And yet there is no coherent management regime for these activities, as the wind farm debate in the Northeast has clearly demonstrated.

A comprehensive offshore management regime is needed that enables us to realize the ocean's potential while safeguarding human and ecosystem health, minimizing conflicts among users, and fulfilling the Government's obligations to manage the sea in a way that maximizes long-term benefits for all the Nation's citizens.

The Commission has recommended that each current and emerging activity in Federal waters be administered by a lead Federal agency, which would coordinate with other applicable authorities to ensure full consideration of the public interest. For example, we recommend establishment of a coherent and predictable Federal management process for offshore renewable sources, such as offshore wind energy, wave energy conversion, and ocean thermal energy conversion.

This renewable energy focus management process would in turn eventually be fully integrated into a balanced ecosystem-based comprehensive offshore management regime that sets forth guiding principles for the coordination of all offshore activity. Such a regime is crucial, if we are to balance competing activities on the OCS.

Now let me turn my attention to environmental issues related to offshore oil and gas. Along with the economic and energy-related benefits of OCS oil and gas production are actual and perceived risks with the environment, coastal community, and competing users. Since the 1969 Santa Barbara blowout, the U.S. oil industry's environmental and safety record has improved significantly. Today, safety stipulations are more stringent, technologies are vastly improved, inspections are regular and frequent, and oil spills response capabilities are in place.

Nevertheless, there remains numerous environmental issues associated with development and production of oil and gas in the OCS. The most obvious of these is more of a perceived risk, as we now understand it. The one most commonly cited is the potential for oil spills, including drill rig blowouts, pipeline spills, and releases from production platforms. However, information compiled by the Minerals and Management Service indicates that OCS offshore facilities and pipelines accounted for only 2 percent of the volume of oil released into the United States waters for the period 1985 to 2001, as mentioned by Senator Landrieu.

By comparison, the National Research Council recently reported that 690,000 barrels of oil entered North American ocean waters each year from land-based human activity. And the other 1-million-plus barrels result from natural seeps emanating from the sea floor. Well, those 690,000 barrels from urban runoff highlight the importance of education and outreach if we are to be successful in changing perceptions and the behavior of the Nation's citizens.

The Commission also highlights the need to increase support for science and technology. The desire for increased exploration and production and increasing capability of drilling in even deeper wa-

ters requires a better understanding of the cumulative, synergistic, and long-term impact of OCS oil and gas development.

The Environmental Studies Program and the Minerals Management Service and other agencies need to be fully funded to ensure public confidence and guide the decision of policymakers. They have been on a serious decline in the last few years, and they have to be brought back or we are not going to have the credibility with the American people.

This is an essential ingredient to measuring the feasibility of bringing the vast reserves of methane hydrate for practical use, for example.

And this brings me to the final issue, and that is funding. There is a clear nexus between activities in Federal waters and the programmatic, regulatory, and management responsibilities they engender. The critical nature of ocean assets and the challenges faced in managing them justify establishment of an ocean policy trust fund in the U.S. Treasury to assist Federal agencies in Coastal States in carrying out the comprehensive ocean policy recommended by our Commission.

The trust fund will be composed of returns from commercial uses of offshore resources, including OCS oil and gas revenues not currently committed to other programs from allowed uses of Federal waters. Trust fund money should be disbursed to Coastal States, other appropriate coastal authorities, and Federal agencies to support improved ocean and coastal management based on an allocation determined by the Congress. The trust fund should be used to supplement, not replace, existing appropriations for ocean and coastal programs.

Let me close by saying the Commission recognizes the importance of balancing the economic needs of the Nation with the protection and conservation of the ecosystems and natural resources that are of economic, as well as aesthetic, importance to our citizens. To utilize these resources in a manner that does not jeopardize the health of the ecosystem requires a much greater degree of coordination and integration among all the entities that have a vested interest in their long-term welfare.

The Commission's report provides a comprehensive strategy for moving our Nation toward such an ecosystem-based management approach. Its implementation requires great political will and new fiscal investment and strong public support, but in the long run all of America will benefit. Leadership from this committee, Mr. Chairman, and others in the Congress and from The White House are essential.

Thank you, Mr. Chairman.

[The prepared statement of Admiral Watkins follows:]

PREPARED STATEMENT OF ADMIRAL JAMES D. WATKINS, U.S. NAVY (RETIRED),
CHAIRMAN, U.S. COMMISSION ON OCEAN POLICY

Mr. Chairman and Members of the Committee, I am pleased to appear before you today in my capacity as the Chairman of the U.S. Commission on Ocean Policy, to discuss Outer Continental Shelf energy-related recommendations from the Commission's Final Report, "*An Ocean Blueprint for the 21st Century*."

As you may be aware, in keeping with the broad mandate given to us by Congress, the Commission's report covers a huge range of topics—from coastal watersheds out to the deepest ocean and from fundamental science to practical problems. It includes over 200 recommendations, primarily directed at the executive and legis-

lative branches of government. I will focus my remarks on the issues related to the topic of this hearing, energy resources on the Outer Continental Shelf. However, I would like to take this opportunity to familiarize the Members of Committee with the report's key findings and recommendations so you can more fully appreciate the broader context in which I am making my comments today.

OUR PRICELESS OCEAN ASSETS

America is a nation intrinsically connected to and immensely reliant on the ocean. All citizens—whether they reside in the country's farmlands or mountains, in its cities or along the coast—affect and are affected by the sea. Our grocery stores and restaurants are stocked with seafood and our docks are bustling with seaborne cargo. Millions of visitors annually flock to the nation's shores, creating jobs and contributing substantially to the U.S. economy through one of the country's largest and most rapidly growing economic sectors: tourism and recreation.

The offshore ocean area under U.S. jurisdiction is larger than its total land mass, providing a vast expanse for commerce, trade, energy and mineral resources, and a buffer for security. Born of the sea are clouds that bring life-sustaining water to our fields and aquifers, and drifting microscopic plants that generate much of the oxygen we breathe. Energy from beneath the seabed helps fuel our economy and sustain our high quality of life. The oceans host great biological diversity with vast medical potential and are a frontier for exciting exploration and effective education. The importance of our oceans, coasts, and Great Lakes cannot be overstated; they are critical to the very existence and well being of the nation and its people. Yet, as the 21st century dawns, it is clear that these invaluable and life-sustaining assets are vulnerable to the activities of humans.

Human ingenuity and ever-improving technologies have enabled us to exploit—and significantly alter—the ocean's bounty to meet society's escalating needs. Pollution runs off the land, degrading coastal waters and harming marine life. Many fish populations are declining and some of our ocean's most majestic creatures have nearly disappeared. Along our coasts, habitats that are essential to fish and wildlife and provide valuable services to humanity continue to suffer significant losses. Non-native species are being introduced, both intentionally and accidentally, into distant areas, often resulting in significant economic costs, risks to human health, and ecological consequences that we are only beginning to comprehend.

Yet all is not lost. This is a moment of unprecedented opportunity. Today, as never before, we recognize the links among the land, air, oceans, and human activities. We have access to advanced technology and timely information on a wide variety of scales. We recognize the detrimental impacts wrought by human influences. The time has come for us to alter our course and set sail for a new vision for America, one in which the oceans, coasts, and Great Lakes are healthy and productive, and our use of their resources is both profitable and sustainable.

It has been thirty-five years since this nation's management of the oceans, coasts, and Great Lakes was comprehensively reviewed. In that time, significant changes have occurred in how we use marine assets and in our understanding of the consequences of our actions. The final report from the U.S. Commission on Ocean Policy provides a blueprint for change in the 21st century, with recommendations for creation of an effective national ocean policy that ensures sustainable use and protection of our oceans, coasts, and Great Lakes for today and far into the future.

THE VALUE OF THE OCEANS AND COASTS

America's oceans, coasts, and Great Lakes provide tremendous value to our economy. Based on estimates in 2000, ocean-related activities directly contributed more than \$117 billion to American prosperity and supported well over two million jobs. By expanding the area to include economic activities along the coast, the numbers become even more impressive; more than \$1 trillion, or one-tenth of the nation's annual gross domestic product, is generated within the relatively narrow strip of land immediately adjacent to the coast that we call the nearshore zone. When the economic activity throughout the entire area of all coastal watershed counties are considered, the contribution swells to over \$4.5 trillion, fully half of the nation's gross domestic product, accounting for some 60 million jobs (Figure 1*).

The United States uses the sea as a highway for transporting goods and people and as a source of energy and potentially lifesaving drugs. Annually, the nation's ports handle more than \$700 billion in merchandise, while the cruise industry and its passengers account for another \$12 billion in spending. More than thirteen million jobs are connected to maritime trade. With offshore oil and gas operations ex-

*All exhibits have been retained in committee files.

panding into ever deeper waters, annual production is now valued at \$25-\$40 billion, and yearly bonus bid and royalty payments contribute approximately \$ 5 billion to the U.S. Treasury.

Ocean exploration has also led to a growing and potentially multi-billion dollar industry in marine-based bioproducts and pharmaceuticals. The commercial fishing industry's total annual value exceeds \$28 billion, with the recreational saltwater fishing industry valued at around \$20 billion, and the annual U.S. retail trade in ornamental fish worth another \$3 billion. Nationwide, retail expenditures on recreational boating alone exceeded \$30 billion in 2002. In fact, tourism and recreation is one of the nation's fastest-growing business sectors, enriching economies and supporting jobs in communities virtually everywhere along the shores of the United States and its territories.

These concrete, quantifiable contributions are just one measure of the value of the nation's oceans, coasts, and Great Lakes. There are many even more important attributes that cannot be given a price tag, such as global climate control, life support, cultural heritage, and the aesthetic value of the ocean with its intrinsic power to relax, rejuvenate, and inspire.

TROUBLE IN PARADISE

Unfortunately, our use and enjoyment of the ocean and its resources have come with costs, and we are only now discovering the full extent of the consequences of our actions. In 2001, 23 percent of the nation's estuarine areas were considered impaired for swimming, fishing, or supporting marine species. In 2003, there were more than 18,000 days of closings and advisories at ocean and Great Lakes beaches, most due to the presence of bacteria associated with fecal contamination. Across the globe, marine toxins afflict more than 90,000 people annually and are responsible for an estimated 62 percent of all seafood-related illnesses. Harmful algal blooms appear to be occurring more frequently in our coastal waters and non-native species are increasingly invading marine ecosystems. Experts estimate that 25 to 30 percent of the world's major fish stocks are overexploited, and many U.S. fisheries are experiencing serious difficulties. Since the Pilgrims first arrived at Plymouth Rock, over half of our fresh and saltwater wetlands—more than 110 million acres—have been lost.

Coastal waters are one of the nation's greatest assets, yet they are being bombarded with pollutants from a variety of sources. While progress has been made in reducing point sources of pollution, nonpoint source pollution has increased and is the primary cause of nutrient enrichment, hypoxia, harmful algal blooms, toxic contamination, and other problems that plague coastal waters. Nonpoint source pollution occurs when rainfall and snowmelt wash pollutants such as fertilizers, pesticides, bacteria, viruses, pet waste, sediments, oil, chemicals, and litter into our rivers and coastal waters. Other pollutants, such as mercury and some organic chemicals, can be carried vast distances through the atmosphere before settling into ocean waters.

Our failure to properly manage the human activities that affect the nation's oceans, coasts, and Great Lakes is compromising their ecological integrity, diminishing our ability to fully realize their potential, costing us jobs and revenue, threatening human health, and putting our future at risk.

U.S. COMMISSION ON OCEAN POLICY CORE RECOMMENDATIONS

Last year the President stated, "We have a changing world. And, yet, the fundamental systems haven't changed . . . (they) were created for the world of yesterday, not tomorrow." Our Commission wholeheartedly agrees with him. While he made these statements in the context of economic policy reforms, they are equally applicable to the management of our oceans and coasts.

There is virtually universal agreement that our oceans are in trouble and the current governance system is poorly structured to address the complicated, cross jurisdictional, ecosystem-based problems we are facing. There is a lack of coordination at all levels. Rather than continue on this path and deal with problems piecemeal as we do now, we have recommended a new approach to national ocean policy, one grounded in an understanding of ecosystems, guided by strong science, and capable of addressing the complex interrelationships among the ocean, land, air, and all living creatures, including humans.

In our Final Report, the Commission identified three major categories of recommendations, each of which is a critical component in supporting the overarching goal of transitioning towards ecosystem-based management:

- First, we need to create a new national ocean policy framework to streamline and improve how the government makes and implements decisions. A new gov-

ernance regime is essential if we are to make the transition toward ecosystem-based management.

- Concurrently, we need to strengthen science and generate high-quality, credible, accessible information. This will require support for basic and applied research, as well as the development of new sensing and observing technologies and a capacity to manage and full utilize the huge amount of data that are generated by these systems.
- And at the same time, we need to greatly enhance ocean education to inspire future leaders and instill citizens with a strong stewardship ethic. Knowledgeable citizens and policy makers will be the driving force behind this new approach to ocean and coastal management.

I want to make it clear that an effective, coordinated and comprehensive national ocean policy will require action in each of these cross-cutting areas: governance, science and education. There is no “silver bullet” or single action that can replace a balanced approach to reform, progress is needed across all three areas. However, we recognize the need to take advantage of opportunities for improvement when they arise; and one area that appears ripe for making progress is the management of federal waters.

COORDINATED GOVERNANCE OF OFFSHORE WATERS

As Congress considers expanding energy-related activities in federal waters, it should take the opportunity to reevaluate the current management regimes and consider how to coordinate the growing suite of activities in these areas. The nation’s vast offshore ocean areas are becoming an increasingly appealing place to pursue economic activities (Figure 4). Well-established institutional frameworks exist for longstanding ocean uses, such as fishing and energy extraction; however, authorities governing new activities, such as the placement of wind farms or aquaculture facilities, need to be clarified. A comprehensive offshore management regime is needed that enables us to realize the ocean’s potential while safeguarding human and ecosystem health, minimizing conflicts among users, and fulfilling the government’s obligation to manage the sea in a way that maximizes long-term benefits for all the nation’s citizens.

The Committee on Ocean Policy, which was established by the President through Executive Order 13366 in December, 2004, supported by congressional action where necessary, should ensure that each current or foreseeable activity in federal waters is administered by a lead federal agency. Well-developed laws or authorities that cover existing programs would not be supplanted, but the lead agency would be expected to continue and enhance coordination among all other involved federal partners. For emerging ocean activities whose management is ill defined, dispersed, or essentially non-existent, the Committee on Ocean Policy and Congress, working with affected stakeholders, should ensure that the lead agency provides strong coordination, while working toward a more comprehensive governance structure.

Based on an improved understanding of offshore areas and their resources, the federal government should work with appropriate state and local authorities to ensure that the many different activities within a given area are compatible, in keeping with an ecosystem-based management approach. As the pressure for offshore uses grows, and before serious conflicts arise, it is critical that the Committee on Ocean Policy review the complete array of single-purpose offshore programs with the goal of achieving coordination among them.

Ultimately, a streamlined program for each activity should be combined with a comprehensive offshore management regime that considers all uses, addresses the cumulative impacts of multiple activities, and coordinates the many authorities with interests in offshore waters. The Committee on Ocean Policy, the proposed President’s Council of Advisors on Ocean Policy, federal agencies, new regional ocean councils, and states will all have roles to play in realizing more coordinated, participatory management of offshore ocean activities.

EXERCISING JURISDICTION OVER NONLIVING RESOURCES IN FEDERAL WATERS

In addition to its responsibilities for living marine resources, the federal government also exercises jurisdiction over nonliving resources, energy and other minerals located in the waters and seabed of the more than 1.7 billion acres of the Outer Continental Shelf (OCS). Offshore oil and gas development has the most mature and broadest management structure of all such resources. It also has the longest and richest history, characterized by major changes to the underlying law that established the more comprehensive administrative regime, as well as intense political conflict resulting from divisions among stakeholders and tensions inherent in American federalism. The development of other ocean energy resources—some of which

are newly emerging technologies—have differing levels of management, but none are currently making any noteworthy contributions to domestic production numbers. Historically, there also have been varying expressions of commercial interest in non-energy minerals in the U.S. exclusive economic zone (EEZ), but only sand and gravel have been used in recent years by coastal states and communities, because of a change which eased access to those resources.

MANAGING OFFSHORE OIL AND GAS RESOURCES

OCS oil and gas development is a classic example of the politics of multiple-use resource management, including federal-state tensions, competing user issues, arguments over the interpretation of data, and disagreements concerning tolerable levels of risk. Despite its political problems, which are best understood through an awareness of the historical context associated with it, today the OCS oil and gas program has a well institutionalized and reasonably comprehensive management regime. While not without its critics, the program seeks to balance the many competing interests involved in offshore energy activity, requires state and local government input in federal decisions, and specifies detailed procedures to be followed by those seeking offshore leases. It also manages the various processes associated with access to non-energy minerals on the OCS. Energy development in federal waters is big business and has become an important part of the fabric of the U.S. ocean policy mix. Most observers agree that the federal OCS oil and gas program benefits America by helping to meet energy needs, creating thousands of jobs, and contributing billions of dollars to the U.S. Treasury. Despite the limited offshore geographic area from which production flows and in which leasing is authorized, the amount of oil and gas production from the OCS is significant.

ENVIRONMENTAL ISSUES RELATED TO OFFSHORE OIL AND GAS PRODUCTION

As with most industrial development activities, along with the economic and energy related benefits of OCS oil and gas production, are actual and perceived risks to the environment, coastal communities, and competing users. Since the 1969 Santa Barbara blowout, the U.S. oil industry's environmental and safety record has improved significantly, as has the regulatory regime of DOI. Today, safety stipulations are more stringent, technologies are vastly improved, inspections are regular and frequent, and oil spill response capabilities are in place. Nevertheless, there remain numerous environmental issues associated with the development and production of oil and gas from the OCS. Foremost among these are:

- Physical damage to coastal wetlands and other fragile areas by OCS-related on-shore infrastructure and pipelines.
- Physical disruption of and damage to bottom-dwelling marine communities.
- Discharge of contaminants and toxic pollutants present in drilling muds and cuttings and in produced waters.
- Emissions of pollutants from fixed facilities, vessels, and helicopters.
- Seismic exploration and production noise impacts on marine mammals, fish, and other wildlife.
- Immediate and long-term ecological effects of large oil spills.
- Chronic, low-level impacts on natural and human environments.
- Cumulative impacts on the marine, coastal, and human environments.

The most obvious of these risks, and the one most commonly cited, is the potential for oil spills including drill rig blowouts, pipeline spills, and chronic releases from production platforms. The impacts of large oil spills can last from years to decades, particularly in critical habitats, such as wetlands and coral reefs. According to MMS, 97 percent of OCS spills are one barrel or less in volume and U.S. OCS offshore facilities and pipelines accounted for only 2 percent of the volume of oil released into U.S. waters for the period 1985-2001.¹ The total volume and number of such spills over that period declined significantly due to industry safety practices and improved spill prevention technology. By comparison, the National Research Council (NRC) estimated that 690,000 barrels of oil enter North American ocean waters each year from land-based human activities, and another 1,118,000 barrels result from natural seeps emanating from the seafloor.²

¹Minerals Management Service. "OCS Oil Spill Facts" Washington, DC: U.S. Department of the Interior, September 2002.

²National Research Council. *Oil in the Sea III: Inputs, Fates and Effects*. Washington, DC: National Academy Press, 2003.

Since 1981, the volume of oil spilled from OCS pipelines is four to five times greater than that from OCS platforms.³ Third party impacts due to events such as anchor dragging and ship groundings, and damages resulting from natural disasters such as hurricanes and underwater landslides, are leading causes of pipeline spills. As noted by the NRC, spills due to structural failures in aging pipelines are also a growing concern.⁴

Long-term exposure to weather and marine conditions makes pipelines older than twenty-five years considerably more susceptible to stress fractures and material fatigue that can lead to spills and leaks. In addition, older pipelines do not incorporate the advanced oil spill detection and prevention technologies that have been developed in recent years.

The MMS Environmental Studies Program (ESP) is a major source of information about the impacts of OCS oil and gas activities on the human, marine, and coastal environments. Since 1986, annual funding for the program has decreased, in real dollars, from a high of \$56 million to approximately \$18 million in 2003. Even accounting for the contraction in the areas available for leasing, the erosion in ESP funding has occurred at a time when more and better information, not less, is needed. There continues to be a need to better understand the cumulative and long-term impacts of OCS oil and gas development, especially in the area of low levels of persistent organic and inorganic chemicals, and their cumulative or synergistic effects.

Also, as noted, OCS oil and gas exploratory activities in the Gulf of Mexico are now occurring in water depths approaching 10,000 feet with projections that the industry will achieve 15,000 feet drilling capabilities within the next decade. The technological ability to conduct oil and gas activities in ever deeper waters on the OCS places a significant and important responsibility on MMS to collect the essential environmental deep-water data necessary for it and other agencies to make informed management and policy decisions on exploration and production activities at those depths. Thus, as the knowledge base increases and the industry expands its activities further offshore and into deeper waters, new environmental issues are emerging that cannot all be adequately addressed under the current ESP budget.

Therefore, the Commission recommended that the U.S. Department of the Interior should expand the Minerals Management Service's Environmental Studies Program. Priorities for the enhanced Environmental Studies Program should include:

- conducting long-term environmental research and monitoring at appropriate outer Continental Shelf (OCS) sites to better understand cumulative, low-level, and chronic impacts of OCS oil and gas activities on the natural and human environments.
- working with state environmental agencies and industry to evaluate the risks to the marine environment posed by aging offshore and onshore pipelines, particularly in the Gulf of Mexico.

This is one of many examples where Congress and the Administration can act now to respond to outstanding ocean-related funding needs, needs that should not have to wait until a comprehensive national ocean and coastal research strategy is developed.

ASSESSING THE POTENTIAL OF OFFSHORE METHANE HYDRATES

Conventional oil and gas are not the only fossil-based fuel sources located beneath ocean floors. Methane hydrates are solid, ice-like structures composed of water and natural gas. They occur naturally in areas of the world where methane and water can combine at appropriate conditions of temperature and pressure, such as in thick sediment of deep ocean basins, at water depths greater than 1,650 feet.

The estimated amount of natural gas in the gas hydrate accumulations of the world greatly exceeds the volume of all known conventional gas resources.⁵ A 1995 U.S. Geological Survey (USGS) estimate of both marine and Arctic hydrate resources revealed the immense energy potential of hydrates in the United States.⁶ These deposits have been identified in Alaska, the east and west coasts of the

³Minerals Management Service. *OCS Oil Spill Facts*. Washington, DC: U.S. Department of the Interior, September 2002.

⁴ National Research Council. *Oil In the Sea III: Inputs, Fates and Effects*. Washington, DC: National Academy Press, 2003.

⁵U.S. Department of the Interior, U.S. Geological Survey. "Gas Hydrates—Will They be Considered in the Future Global Energy Mix?" <www.usgs.gov/public/press/public_affairs/press_releases/pr1824m.html> Posted December 10, 2003; accessed March 12, 2004.

⁶National Oil and Gas Resource Assessment Team. *1995 National Assessment of United States Oil and Gas Resources*. U.S. Geological Survey Circular 1118. Washington, DC: U.S. Government Printing Office, 1995.

United States, and in the Gulf of Mexico. USGS estimated that the methane hydrates in U.S. waters hold a mean value of 320,000 trillion cubic feet of natural gas, although subsequent refinements of the data have suggested that the estimate is a slightly more conservative 200,000 trillion cubic feet.⁷ Even this lower estimate is enough to supply all of the nation's energy needs for more than 2,000 years at current rates of use.⁸

However, there is still no known practical and safe way to develop the gas and it is clear that much more information is needed to determine whether significant technical obstacles can be overcome to enable methane hydrates to become a commercially viable and environmentally acceptable source of energy.

In the United States, federal research concerning methane hydrates has been underway since 1982, was intensified in 1997-98, and received further emphasis with the passage of the Methane Hydrate Research and Development Act in 2000. That Act established an interagency coordination mechanism that includes the U.S. Departments of Energy, Commerce, Defense, and the Interior, and the National Science Foundation, and directed the National Research Council to conduct a study on the status of research and development work on methane hydrates. At the time that the Commission's final report went to press the NRC report had not been released.

In our report, the Commission recommended that the proposed National Ocean Council, working with the U.S. Department of Energy and other appropriate entities, should review the status of gas hydrates research and development to determine whether methane hydrates can contribute significantly to meeting the nation's long-term energy needs. If such contribution looks promising, the President's recently established Committee on Ocean Policy, should recommend an appropriate level of investment in methane hydrates research and development, and determine whether a comprehensive management regime for industry access to hydrate resource deposits is needed.

DEVELOPING OFFSHORE RENEWABLE ENERGY RESOURCES

Environmental, economic, and security concerns have heightened interest among many policy makers and the public in renewable sources of energy. Although offshore areas currently contribute little to the nation's supply of renewable energy, the potential is significant and could include wind turbines, mechanical devices driven by waves, tides, or currents, and ocean thermal energy conversion, which uses the temperature difference between warm surface and cold, deep-ocean waters to generate electricity.

OFFSHORE WIND ENERGY DEVELOPMENT

While the offshore wind power industry is still in its infancy in the United States, it is being stimulated by improved technology and federal tax credits that have made it more attractive commercially. Additionally, developers are looking increasingly to the lead of European countries such as Denmark, the United Kingdom, and Germany, where growing numbers of offshore projects are being licensed. In fact, the United States already has a wind energy management program applicable on some federal lands onshore. This comprehensive program is carried out by DOI's Bureau of Land Management under broad authority provided by the Federal Land Policy and Management Act.

Conversely, there is no comprehensive and coordinated federal regime in place to regulate offshore wind energy development or to convey property rights to use the public space of the OCS for this purpose. In the absence of a specific regime, the U.S. Army Corps of Engineers (USACE) is the lead federal agency responsible for reviewing and granting a permit for this activity. Its authority, however, is based on Section 10 of the Rivers and Harbors Act, which, although it has a public interest requirement, primarily regulates obstructions to navigation, including approval of any device attached to the seafloor. In reviewing a proposed project under Section 10, the USACE is required by the National Environmental Policy Act to consult other federal agencies. Depending on the circumstances, these agencies and authorities may include:

- The U.S. Coast Guard, which regulates navigation under several federal statutes.

⁷ Congressional Research Service. "Methane Hydrates: Energy Prospect or Natural Hazard?" <www.cnlle.org/nle/crsreports/energy/eng-46.pdf> Updated February 14, 2004; accessed March 12, 2004.

⁸ Monastersky, R. The Ice That Burns: Can Methane Hydrates Fuel the 21st Century? *Science News* 154, no. 20 (November 14, 1998): 312.

- The Federal Aviation Administration, which regulates objects that may affect navigable airspace pursuant to the Federal Aviation Act.
- The U.S. Environmental Protection Agency, which may conduct a review for potential environmental impacts of a project pursuant to the Clean Water Act and Clean Air Act.
- The National Marine Fisheries Service (NMFS), which may review projects for potential impacts to fishery resources pursuant to the Magnuson-Stevens Fishery Conservation and Management Act. In addition, NMFS' review includes assessing potential impacts to endangered or threatened species under the Endangered Species Act or the Marine Mammal Protection Act.
- The U.S. Fish and Wildlife Service, which may review projects for potential impacts to endangered species or marine mammals under its jurisdiction pursuant to the Endangered Species Act or the Marine Mammal Protection Act.
- In addition, depending on its location, a wind energy project, or at least its Section 10 permit, may be subject to review by one or more state coastal management programs in accordance with the CZMA federal consistency provisions.

The Section 10 review process stands in stark contrast both to the well established DOI regulatory program for onshore wind energy and, in the marine setting, to the robust regulatory program for offshore oil and gas that has developed under the Outer Continental Shelf Lands Act (OCSLA). Using the Section 10 process as the primary regulatory vehicle for offshore wind energy development is inadequate for a number of reasons. First and foremost, it cannot grant leases or exclusive rights to use and occupy space on the OCS. It is not based on a comprehensive and coordinated planning process for determining when, where, and how this activity should take place. It also lacks the ability to assess a reasonable resource rent for the public space occupied or a fee or royalty for the energy generated. In other words, it lacks the management comprehensiveness that is needed to take into account a broad range of issues, including other ocean uses in the proposed area and the consideration of a coherent policy and process to guide offshore energy development.

WAVE ENERGY CONVERSION—CURRENT AND TIDAL

Various technologies have been proposed to use wave or tidal energy, usually to produce electricity. The wave energy technologies for offshore use include floating or pitching devices placed on the surface of the water that convert the horizontal or vertical movement of the wave into mechanical energy that is used to drive a turbine. Currently, the offshore wave, tidal, and current energy industry is in its infancy. Only a small proportion of the technologies have been tested and evaluated.⁹ Nonetheless, some projects are moving forward in the United States, including one to install electricity-producing wave-energy buoys more than 3 nautical miles offshore Washington State, in the Olympic Coast National Marine Sanctuary. Internationally, there is considerable interest in wave, tidal, and current energy, but the projects are almost all in the research and development stage.

The Federal Energy Regulatory Commission (FERC) asserts jurisdiction, under the Federal Power Act (FPA), over private, municipal, and state (not federal) hydropower projects seaward to 12 nautical miles. FERC has formally asserted jurisdiction over the Washington State project, and is likely to assert jurisdiction over all forms of wave, tidal, or current energy projects whose output is electricity, from the shoreline out to 12 nautical miles offshore, on the basis that they are "hydropower" projects under the FPA. Although in issuing a license for a wave, current, or tidal project, FERC is directed by the FPA to equally consider environmental and energy concerns, it is not an agency with a broad ocean management mission. As with wind energy, several other federal laws may apply to ocean wave projects. For example, NEPA, the federal consistency provision of the CZMA, the National Historic Preservation Act, and the Fish and Wildlife Coordination Act may apply, as may the consultation provisions of the Endangered Species Act and the Marine Mammal Protection Act. But there is no comprehensive law that makes clear which of these individual laws may be applicable, nor is there any indication that overall coordination is a goal, thus leaving implementation to mixed federal authorities.

OCEAN THERMAL ENERGY CONVERSION

The surface waters of the world's tropical oceans store immense quantities of solar energy. Ocean thermal energy conversion (OTEC) technology could provide an eco-

⁹ California Energy Commission. "Ocean Energy." <www.energy.ca.gov/development/oceanenergy/> Accessed December 16, 2003.

nomically efficient way to tap this resource to produce electric power and other products. The U.S. government spent over \$200 million dollars in OTEC research and development from the 1970s to the early 1990s that produced useful technical information but did not result in a commercially viable technology.¹⁰ Early optimism about the potential of OTEC led to the enactment of the Ocean Thermal Energy Conversion Act in 1980, and the creation of a coordinated framework and licensing regime for managing that activity if and when economic considerations permitted. NOAA issued regulations to implement the Act, but because of investor risk for this capital-intensive technology and relatively low fossil fuel prices, no license applications were ever received and NOAA subsequently rescinded the regulations in 1996. Thus, the United States currently has no administrative regulatory structure to license commercial OTEC operations.

COMPREHENSIVE MANAGEMENT FOR OFFSHORE RENEWABLE ENERGY

Offshore renewable technologies will continue to be studied as a means of reducing U.S. reliance on potentially unstable supplies of foreign oil, diversifying the nation's energy mix, and providing more environmentally benign sources of energy. Similar to offshore aquaculture described in Chapter 22 of the Commission's report, the offshore renewable processes described in this section present obvious examples of the shortcomings in federal authority when it comes to regulating specific new and emerging offshore activities. As long as federal agencies are forced to bootstrap their authorities to address these activities, the nation runs the risk of unresolved conflicts, unnecessary delays, and uncertain procedures. What is urgently needed is for the Committee on Ocean Policy to develop a comprehensive offshore management regime (as recommended in Chapter 6) that considers all offshore uses within a larger planning context. A coherent and predictable federal management process for offshore renewable resources that weighs the benefits to the nation's energy future against the potential adverse effects on other ocean users, marine life, and the ocean's natural processes, should be fully integrated into the broader management regime.

In light of the growing interest in renewable energy, the Commission has recommended that Congress, with input from the Committee on Ocean Policy, should enact legislation providing for the comprehensive management of offshore renewable energy development as part of a coordinated offshore management regime.

Specifically, this legislation should:

- be based on the premise that the oceans are a public resource.
- streamline the process for licensing, leasing, and permitting renewable energy facilities in U.S. waters.
- subsume existing statutes, such as the Ocean Thermal Energy Conversion Act.
- ensure that the public receives a fair return from the use of the resource and that development rights are allocated through an open, transparent process that considers state, local, and public concerns.

DEDICATING REVENUE FROM OCEAN USES FOR IMPROVED OCEAN MANAGEMENT EXISTING AND EMERGING USES

Various parts of the Commission's report discuss federal revenues that are, or may be, generated from offshore activities. Chapter 6 introduces the concept of resource rents, the economic value derived from the use or development of a natural resource. It recommends that the use of a publicly-owned resource by the private sector be contingent on providing a reasonable return of some portion of the revenues to taxpayers. Chapter 24, on nonliving resources in federal waters, discusses the substantial revenues already flowing into land conservation and historic preservation funds and the U.S. Treasury from outer Continental Shelf (OCS) oil and gas development. The Commission goes on to suggest that a greater share of the revenues received from the extraction of OCS oil and gas resources should be granted to coastal states for the conservation and sustainable development of renewable ocean and coastal resources. OCS oil and gas producing states would receive a larger portion of such revenues to address the impacts in their states from the activity in adjacent federal offshore areas.

Chapter 24 also addresses the potential emergence of offshore renewable energy resources, including the growing interest in offshore wind farms, and wave and ocean thermal gradient energy conversion. As recommended in Chapter 6, these

¹⁰ Jones, A.T., and W. Rowley. "Global Perspective: Economic Forecast for Renewable Ocean Energy Technologies." *Marine Technology Society Journal* 36, no. 4 (Winter 2002-2003).

emerging activities will require a comprehensive management regime that ensures a fair return to the public for the use of marine resources.

REVENUES FOR OCEAN AND COASTAL MANAGEMENT: THE OCEAN POLICY TRUST FUND

The nexus between activities in federal waters and the programmatic, regulatory, and management responsibilities they engender is clear. The actions recommended in this report are all linked in some way to our use of the ocean. The critical nature of ocean assets, and the challenges faced in managing them, justify the establishment of an Ocean Policy Trust Fund in the U.S. Treasury to assist federal agencies and coastal states in carrying out the comprehensive ocean policy recommended by this Commission. The Trust Fund would be composed of returns from commercial uses of offshore resources, including OCS oil and gas revenues not currently committed to other programs, and any future revenues from allowed uses of federal waters. The Land and Water Conservation Fund, the National Historic Preservation Fund, and the OCS oil and gas revenues currently allocated to coastal states from the ocean areas that lie 3 nautical miles seaward of state waters would not be affected. Only after the revenues for those programs were provided in accordance with law, would any remaining OCS monies be deposited in the Trust Fund.

As a practical matter, now and for the foreseeable future, all the revenues flowing into Trust Fund would come from OCS oil and gas revenues, virtually all of which are derived from activities in the central and western Gulf of Mexico. The drilling in the Gulf is an ongoing activity and an important contributor to our domestic supply of energy. The revenues coming from the Gulf that are not allocated to other purposes are currently credited to miscellaneous receipts of the Treasury. They are either used for other governmental activities or are counted against the deficit. The Commission has determined that funds generated from activities in offshore waters are an appropriate and important source of revenues to dedicate to a new and comprehensive national ocean policy.

Approximately \$5 billion is generated annually from the various forms of OCS oil and gas revenues. Protecting the three programs noted above would remove about \$1 billion. Thus, some \$4 billion a year of oil and gas money remains available for the Ocean Policy Trust Fund under current projections, enough to fund the full cost of implementing the Commission's recommendations. While it would be purely speculative to estimate the amount and timing of revenues that might be produced by newer uses in federal waters, such resource revenues should also be deposited in the Trust Fund as they begin to flow.

Consequently, the Commission has recommended that Congress should establish an Ocean Policy Trust Fund in the U.S. Treasury, composed of unallocated federal revenues from outer Continental Shelf (OCS) oil and gas activities, plus revenues from any new activities approved in federal waters, to support the nation's new coordinated and comprehensive national ocean policy. Trust Fund monies should be disbursed to coastal states, other appropriate coastal authorities, and federal agencies to support improved ocean and coastal management, based on an allocation determined by Congress with input from the Committee on Ocean Policy. The Trust Fund should be used to supplement—not replace—existing appropriations for ocean and coastal programs.

The Ocean Policy Trust Fund should be distributed as follows:

- \$500 million in the first year, increasing to \$1.0 billion in the third and subsequent years, among all coastal and Great Lakes states, territories, and federally-recognized tribes with coastal resource treaty rights. A larger share should go to OCS producing states to address offshore energy impacts. The funds should be used for the conservation and sustainable development of renewable ocean and coastal resources, including any new responsibilities that arise as a result of Commission recommendations and the expansion of programs and activities that are currently underfunded.
- the remainder of the funds to federal agencies to address the new or expanded activities assigned to them as a result of Commission recommendations.

The sole intent of the Trust Fund is to ensure a dedicated source of funding for improved ocean and coastal management, including the sustainability of renewable resources. It is not intended to either promote or discourage offshore uses authorized under existing laws, and the Fund itself would not drive activities in offshore waters. Rather, all proposed actions would be evaluated under established statutes and governance structures, including the NEPA process. Chapter 6 recommends an offshore management regime in which all activities in federal waters are better coordinated and are guided by principles including sustainability, stewardship, good science, ecosystem-based management, and preservation of marine biodiversity. Once an activity is deemed acceptable, the resulting resource rents due to the Amer-

ican taxpayer for the use of a public resource would be deposited into the Trust Fund to be devoted exclusively to ocean and coastal issues, as noted above.

The design and establishment of the Trust Fund are within the jurisdiction of Congress. Thus, Congress will need to determine how the Fund will be set up, the process and criteria for the distribution of the monies, the formula or method for allocating the funds among coastal states, the eligible uses of the funds, and appropriate connections to existing laws and authorities. The Committee on Ocean Policy and the proposed nonfederal President's Council of Advisors on Ocean Policy will be in an excellent position to provide input on these questions.

CLOSING STATEMENT

The Commission fully understands the importance of balancing the economic needs of the nation with the protection and conservation of the ecosystems and natural resources that are of such economic as well as aesthetic importance to our citizens. To utilize these resources in a responsible manner, in a manner that does not jeopardize the health of the ecosystem, requires a much greater degree of coordination and integration among all of the entities that have a vested interest in their long-term welfare. The Commission's report provides a comprehensive strategy for moving our nation closer to implementing such an ecosystem-based management approach.

While I have discussed those recommendations most closely associated with activities in federal waters on the Outer Continental Shelf, I hope that you and your staff take the time to review the comprehensive suite of recommendations we have developed at your request. It has taken more than 35 years for the nation to refocus its attention on these vital resources. Our report provides a blueprint for the 21st century. Its implementation will require great political will, significant fiscal investment, and strong public support, but in the long run all of America will benefit. The time to act is now and everyone who cares about the oceans and coasts must play a part. Leadership from this Committee and others in Congress, and from the White House, will be essential.

The CHAIRMAN. Admiral, did you read your entire statement?

Admiral WATKINS. Yes, sir, I did.

The CHAIRMAN. Could I just inject an observation? And then we will proceed right to you, ma'am.

I think heretofore when we consider offshore resources and drilling, one of the principal objectives had always been: How much revenue does the national treasury get? And, Senator Landrieu, you stated in your opening remarks the terrific amount of money that has gone into the treasury.

This is just your chairman's observation. I think the time has come to change. And I do not think the primary concern ought to be how much money goes into the treasury. I think the concern should be: How do we better distribute the money so as to get conservation and assurances that the program will yield better results in terms of safety and welfare?

Simply put, I think we ought to decide where the money goes rather than just simplistically saying the Federal Government gets it and it will do the right thing. I think we should be saying what we think it should be used for. Maybe it goes to the States for their use, if they are the ones put at risk. And I just state that as a part of any consideration that we might have as a committee.

Now having said that, I want to thank the Senators that have just arrived. Thank you very much for coming. Senator Bunning, thank you.

We are going to move along unless you have statements that you want to give now.

Yes, Senator Thomas.

Senator THOMAS. I just wanted to welcome Johnnie Burton to the panel, who of course is a Wyoming native and has done a great

deal for us in Wyoming. And we are delighted to have you here, Johnnie.

Ms. BURTON. Thank you, Senator.

The CHAIRMAN. Senator Bunning.

Senator BUNNING. Mr. Chairman, I would just like to enter a statement into the record.

The CHAIRMAN. It will be done.

[The prepared statement of Senator Bunning follows:]

PREPARED STATEMENT OF JIM BUNNING, U.S. SENATOR FROM KENTUCKY

Thank you, Mr. Chairman.

I am happy we are having this hearing today to discuss the important topic of examining OCS to increase our domestic energy production.

Natural gas and oil prices are an important issue for many businesses and consumers in Kentucky and the rest of the country.

Many businesses have talked to me about the financial crunch they are experiencing from the high price of oil and natural gas. The high prices are having an effect on Americans' wallets too.

Americans need to have access to adequate supplies of energy at affordable prices in order to keep our economy running.

Now is the time for us to boost our domestic energy sources as well as promote conservation.

I hope that we can learn more about the possibilities of OCS today and how it could affect our country's supply of energy.

I appreciate the time our witnesses have taken today to come testify.

Thank you.

The CHAIRMAN. Now, ma'am, would you proceed, please? Your statement will be made a part of the record as if read. And go ahead and abbreviate your statement, if you would.

**STATEMENT OF R.M. "JOHNNIE" BURTON, DIRECTOR,
MINERALS MANAGEMENT SERVICE**

Ms. BURTON. Mr. Chairman, before I start I would like to draw the attention of the committee to the fact that you should have a package of visual graphics that I will refer to when I talk. And I would like this to be made part of the record, if I could.

The CHAIRMAN. It will be attached to the record, but we do not have it here. They are getting it. Are you going to put it up there?

Ms. BURTON. No, sir, I was not planning to.

The CHAIRMAN. But what are those things up there for? Are they for us? For the second panel. Okay.

All right. Please proceed.

Ms. BURTON. Thank you. Mr. Chairman, members of the committee, I appreciate the opportunity to appear here today to highlight for you the important and vital role Federal offshore lands continue to play with respect to our Nation's energy future.

In passing the OCS Lands Act, the accompanying congressional declaration of policy states, "The OCS is a vital national resource reserve held by the Federal Government for the public, which should be made available for expeditious and orderly development." The administration has directed the Minerals Management Service to meet this mandate through specific policy initiatives provided in the President's national energy policy. This policy direction is critical in the face of the worldwide energy-tight markets. The situation in which we find ourselves today did not develop overnight and cannot be fixed overnight.

The Federal OCS is a major supplier of oil and natural gas for the domestic market. OCS production accounts for over 30 percent of domestic oil production and 23 percent of domestic gas production.

Today, MMS administers over 8,200 leases and oversees about 4,000 offshore facilities. As you can see from chart one, this represents 190 percent increase in leases since MMS was formed in 1982. As chart two illustrates, the OCS is projected to increase its share of oil production to over 40 percent within the next 5 years.

For natural gas, although the near-term projections indicate a slight decline in OCS production, as shown on chart three, it is estimated that the OCS will provide an increased share in the future as deep gas play in shallow water is developed.

Clearly, the most significant trend on the OCS is the surge of interest in the deep water areas of the Gulf. There have been about 150 discoveries in deep waters over the past 10 years with about 90 fields now in production. Over the past 3 years, in ultra-deep water, there have been 24 significant discoveries.

We are similarly enthused about the potential for deep and ultra-deep drilling for natural gas on the traditionally explored areas of the shelf. Some of the ultra-deep gas plays currently being targeted are estimated to contain as much as 4 trillion cubic feet of natural gas. MMS has approved five such exploration plans in the last year.

The positive trends in both deep water and deep geologic horizons are in part a result of the National Energy Plan directives to provide royalty incentives for these high-cost frontier provinces. MMS has established a suite of economic incentives to promote discovery of new sources of energy and to stimulate environmentally preferred natural gas production both in the Gulf of Mexico and offshore Alaska.

Regarding the long term, we must understand that there are long lead times for accessing frontier areas of the OCS. Lease sales cannot be held unless they are part of the 5-year program. Once a lease sale is held, it could take 5 to 8 years before drilling starts and another 5 years before production flows.

In the last 30 years, technological advancements in the offshore industry have made production safer and more environmentally sound. Technological advances help companies better identify prospects, allow for more efficient well placement, and improve the chances of success. A single platform today may accommodate five or six fields. Other improvements include better treatment of produced water, better air pollution control, and more energy efficient production.

MMS has increased its inspection activities over 60 percent since 1999, as chart four demonstrates. Thanks to technological advances and industry's commitment to safety, the number of lost workday incidents is down 65 percent since 1996, as illustrated in chart five.

The OCS environmental record is exemplary and improving. As chart six indicates, the spill rate for a billion barrels of oil produced has decreased dramatically over each of the past three decades. There has not been a significant OCS platform spill for the past 35 years. As the recent National Academy of Sciences report revealed,

the offshore operations contribute about 2 percent of the total oil in the sea, as shown on chart seven.

MMS has worked diligently for the past 20 years to create a framework for science-based decision in consultation. The U.S. Ocean Commission on Ocean Policy in its report stated, "The scope and comprehensiveness of the OCS oil and gas program can be a model for the management of a wide variety of offshore activities."

The OCS is estimated to hold about 60 percent and 41 percent of the Nation's remaining undiscovered oil and gas resources, respectively. However, there is great uncertainty regarding the potential in areas where the last geophysical surveys and drilling exploration occurred more than 25 years ago. We simply do not have specific reliable estimates without the information new geophysical and exploration methods would provide.

Over the past few years, we have witnessed increased interests in alternative uses of the OCS, such as wind and wave energy, which was mentioned before. However, we are confronted with a lack of legislative authority to consider some of these proposals. The administration developed a legislative proposal to address these alternative use issues. Enactment of this proposal is called for in the President's Ocean Action Plan.

In conclusion, Mr. Chairman, MMS stands ready to apply our management experience to implement whatever policy decision is directed. And I will answer questions when you are ready, sir.

The CHAIRMAN. Thank you very much.

[The prepared statement of Ms. Burton follows:]

PREPARED STATEMENT OF R.M. "JOHNNIE" BURTON, DIRECTOR, MINERALS
MANAGEMENT SERVICE, DEPARTMENT OF THE INTERIOR

Mr. Chairman and Members of the Committee, I appreciate the opportunity to appear here today to highlight for you and Members of the Committee the important and vital role Federal offshore lands continue to play with respect to our Nation's energy future.

America faces an energy challenge. Energy use sustains our economy and our quality of life, but high prices and increasing dependence on foreign energy supplies raises important national policy issues. There is no one single solution. Achieving the goal of secure, affordable and environmentally sound energy will require diligent, concerted efforts on many fronts on both the supply and demand sides of the energy equation.

President Bush's National Energy Policy (NEP) report laid out a comprehensive, long-term energy strategy for securing America's energy future. That strategy recognizes that to reduce our rising dependence on foreign energy supplies, we must also increase domestic production, while pursuing energy conservation and the use of alternative and renewable energy sources.

Most media coverage focuses on the parts of the National Energy Policy that discuss production of traditional energy, but increased energy conservation and alternative and renewable sources are also critical components of the President's balanced, comprehensive policy. Good stewardship of resources dictates that we use energy efficiently and conserve resources. Thus, fossil fuel development is only a part of the solution to our Nation's energy issues.

The Outer Continental Shelf Lands Act directs the Secretary of the Interior to make resources available to meet the nation's energy needs. The accompanying Congressional Declaration of Policy states, "*The OCS is a vital national resource reserve held by the Federal Government for the public, which should be made available for expeditious and orderly development.*" As the Department of the Interior's offshore resource management agency, the Minerals Management Service (MMS) has a focused and well established ocean mandate—to balance the exploration and development of oil, gas, and marine minerals resources of the Outer Continental Shelf (OCS) with environmental protection and safety.

CURRENT ENERGY PICTURE

Oil is vital to the American economy. Currently, it supplies more than 40 percent of our total energy demands and more than 99 percent of the fuel we use for cars and trucks. According to the Energy Information Administration, over the next 20 years Americans' demand for energy is expected to grow at an annual rate of 1.4 percent. This growth projection incorporates continued gains in energy efficiency and movement away from energy-intensive manufacturing to service industries. Despite a continuing emphasis on expanding other sources of energy, petroleum products and natural gas are projected to account for almost 65 percent of domestic energy consumption in 2025, a slightly larger share than today.

U.S. natural gas consumption is expected to grow from 22 trillion cubic feet (tcf) in 2003 to almost 31 tcf in 2025. Domestic production, however, is predicted to grow from 19.1 tcf to 21.8 tcf, meeting only about 30 percent of projected growth demand. In the past, any difference between the growth in demand and the growth in domestic production was predominantly met by imports of gas from Canada. However, Canada's National Energy Board has concluded that their future production will not support increased U.S. import requirements. Most additional supplies will need to come from Alaskan natural gas, coalbed methane, the OCS, imports of LNG, or possibly other undeveloped sources.

Predictably, markets are responding to this outlook with higher energy prices, and an increased demand for OCS resources. This is apparent from recent interest in lease sales and an increasing pace of exploration and development. The mandate of the OCSLA and prudent policy considerations also warrant an increased examination of the OCS energy option.

OFFSHORE FEDERAL OCS OIL AND NATURAL GAS PROGRAM

The Federal OCS is a major supplier of oil and natural gas for the domestic market, contributing more oil and natural gas for U.S. consumption than any single state or country in the world. As steward of the mineral resources on the 1.76 billion acres of the Nation's OCS, MMS has, since 1982, managed OCS production of 9.6 trillion barrels of oil and more than 109 tcf of natural gas for U.S. consumption.

Today, MMS administers approximately 8,200 leases and oversees approximately 4000 facilities on the OCS. This compares to about 2,800 leases and 2000 facilities in 1982. OCS production accounts for over 30 percent of the Nation's domestic oil production and approximately 23 percent of our domestic natural gas production. Within the next 5 years, offshore production will likely account for more than 40 percent of oil and 26 percent of U.S. natural gas production, owing primarily to deep water discoveries.

As the OCS resource management agency, MMS has worked diligently for over 20 years to create a framework for OCS mineral resource development. Principles guiding our management of the resources of the OCS include: conservation of resources by providing for their most efficient use; assurance of a fair and equitable return to the public for rights conveyed; protection of the human, marine, and coastal environments; involvement of interested and affected parties in planning and decision-making; and minimization of conflicts between mineral activities and other uses of the OCS. MMS also has over two decades of experience working with coastal states regarding coastal zone issues related to development on the OCS. The U.S. Commission on Ocean Policy in its report, "An Ocean Blueprint for the 21st Century," stated, "the scope and comprehensiveness of the OCS oil and gas program can be a model for the management of a wide variety of offshore activities."

ECONOMIC/ENERGY BENEFITS FROM THE OFFSHORE PROGRAM
(REVENUES, RESOURCE ESTIMATES, HYDRATES)

OCS lease sales and production have generated more than \$156 billion in revenue from bonus bids, rentals, and royalty payments. The OCS oil and gas industry directly employs about 42,000 workers, mostly in the Gulf of Mexico area. Spending by suppliers and other companies that support the industry, as well as by employee households, account for another 90,000 or more jobs throughout the country.

The billions of dollars in revenue collected by MMS annually from energy companies for offshore and onshore oil and gas leasing and production is one of the largest sources of non-tax revenue to the Federal Government. OCS leasing and production provides the majority of oil and gas annual revenue collected by MMS—about 66 percent of the \$8 billion collected in FY 2004. Annually, nearly \$1 billion from OCS revenues go into the Land and Water Conservation fund for the acquisition and development of state and Federal park and recreation lands. Additionally, more than \$3 billion from OCS oil and gas production royalties has been disbursed to the His-

toric Preservation Fund to help protect and preserve hundreds of American battle fields, historic building, historic landmarks, and tribal properties and cultural traditions.

NATIONAL ENERGY POLICY ROLE

The President's NEP provides us with directives to diversify and increase energy supplies, encourage conservation, and ensure adequate energy distribution. One of the NEP challenges is to increase energy supplies while protecting the environment. MMS has implemented a number of NEP directives to increase domestic energy supplies and enhance national energy security by ensuring continued access to Federal lands for domestic energy development, and by expediting permits and other federal actions necessary for energy-related project approvals.

For example, we are helping to ensure that the OCS remains a solid contributor to the Nation's energy and economic security by holding OCS lease sales in available areas on schedule. Since May 2001, DOI has held 14 OCS oil and natural gas lease sales on schedule while going through a comprehensive consultation process with other Federal agencies, State and local governments, and the public. These sales resulted in leasing of almost 19 million acres of OCS lands to industry for oil and gas exploration and development, and generated about \$2.4 billion dollars in bonus bid revenue (not counting future royalties and rentals) for the U.S. Treasury. Production from leases issued as a result of these sales will contribute substantially to future domestic oil and gas production. MMS is on track for completing the next 5-Year Program by July 2007, which will establish the schedule for future OCS lease sales during the 2007-2012 timeframe.

The NEP also recommended that we consider economic incentives for environmentally sound offshore oil and gas development where warranted by specific circumstances. MMS has established a suite of economic incentives to promote discovery of new sources of energy for the Nation and stimulate domestic oil and natural gas production. For 2001-2005 OCS lease sales, we continued the royalty incentive program—first established by the Deep Water Royalty Relief Act of 1995—to promote interest in deep water leases, and expanded the incentive program to promote development of new natural gas supplies from deep horizons in the Gulf's shallow waters. A new regulation in January 2004 extended the deep gas incentive to leases issued before the incentives were first provided in 2001, to promote additional deep drilling for natural gas on the shelf. MMS has, also developed policies for extending lease terms to aid in planning wells to be drilled to sub-salt and ultra-deep prospects, accounting for the additional complexity and cost of planning and drilling such wells.

MMS has also provided economic incentives for all Alaska OCS lease sales to promote leasing interest and encourage oil and gas exploration development in this area of high cost and little infrastructure.

The NEP also directs us to permit energy production in an environmentally sound manner by expediting permits and other Federal actions necessary for energy-related project approvals. To help streamline our procedures, the offshore program is implementing an e-Government Transformation project known as OCS Connect, to reform and streamline MMS's offshore program operations by 2008. It is foremost an integrated business process re-engineering project that will change the manner in which MMS delivers its mission. By moving to online service delivery, our organization will be more "connected" to our customers: industry, citizens and other government agencies. OCS Connect will:

- Maximize citizen involvement by delivering essential information and allowing input via the Internet
- Streamline mission delivery by automating major business transactions and providing "digital" data management, such as plan review, resulting in more timely decisions
- Simplify and unify government by minimizing redundant reporting, and streamlining government interactions with industry and the public
- Leverage market-based practices by using common oil and gas standards and solutions (e.g., data model, exchange standards)
- Ensure timely approvals of plans and permits

In addition, we have been working closely with other agencies to develop a more efficient means of issuing permits. We have been working with NOAA to achieve prompt and efficient consultations under the Endangered Species Act and rulemakings under the Marine Mammal Protection Act; and on revisions to their Coastal Zone Management Act consistency regulations.

MMS also is working in partnership with the U.S. Coast Guard to improve regulatory oversight of oil and gas operations where there is overlapping jurisdiction.

Under a new Memorandum of Understanding (MOU), we have streamlined the process for inspections of offshore facilities, improving government efficiency and reducing a reporting burden on industry. The NEP also directed that the Administration determine whether or not to resume deliveries of oil for the Strategic Petroleum Reserve (SPR), the nation's supply of emergency crude oil. Responding to a Presidential directive issued in November 2001, the Department of the Interior (DOI), in partnership with the Department of Energy, launched the SPR Fill Initiative to fill the SPR to 700 million barrels using royalty in kind oil produced from OCS Gulf of Mexico leases. This initiative should be completed by summer 2005.

CURRENT STATUS

Technology Advances

In the last 30 years, technological advancements in the offshore oil and natural gas industry that make production safer and more environmentally sound have occurred in every step of the process. In the area of exploration, technological advances help companies better identify prospects, allow for more effective well placement, improve the development of resources, reduce the number of dry holes, and cut exploration time. This reduces the footprint left by exploration, generates less waste, and improves understanding of reservoirs to improve production.

Once production begins, combined with advances in extended reach and directional drilling advanced recovery techniques allow for increased production, recovering 50 percent more oil and 75 percent more gas from a well than was recovered 30 years ago. Improved reservoir management reduces the amount of water produced. Other improvements include better treatment of produced water, better air pollution control, more energy-efficient production, and reduced emissions of greenhouse gases.

Additionally, using new techniques in reservoir management, more oil and natural gas can be produced today, with fewer wells than 30 years ago. Technology applied to reservoir management includes artificial lift, for increased production; downhole oil/water separation; and advanced data management. And advancements in materials engineering have led to the increased use of advanced composite materials for parts of structures and mooring systems. These materials are strong, lightweight, and able to withstand the offshore environment. This allows for platforms that are lighter and smaller, leaving a smaller footprint. These platforms also require less maintenance and repair.

Deep Water Gulf of Mexico

The strongest trend on the OCS today is the continuing development of the Gulf of Mexico deep water acreage. The U.S. is now in its ninth year of sustained expansion of domestic oil and gas development in the deep water area of the Gulf of Mexico (GOM). Deep water means that from water surface to where a drill bit first touches mud is at least 1,000 feet—that is almost twice the height of the Washington Monument. So for a moment imagine a floating drill ship perched in water the height of two Washington Monuments, subject to the forces of waves and ocean currents, maintaining its position while remotely directing drilling operations through 1,000 feet or more of pipe casing to reach a reservoir of oil or natural gas, while controlling for extreme temperature and pressure.

In 2004, operators announced 14 new deep water *producing* projects and 12 new deep water *discoveries*. Anticipated production from these facilities will help sustain production increases in deep water, and fields with names such as *Thunder Horse*, *Atlantis*, and *Mad Dog* will dramatically raise production in 2005 and 2006. We expect that it will be several years before deep water areas of the Gulf of Mexico reach their full potential. The continued use of royalty incentives in the deep waters of the Gulf is intended to keep industry moving forward on new technologies and exploring deeper water frontiers. The deep water activity in the Gulf of Mexico has been a major success story. Deep water oil production has risen 386 percent and deep water gas production is up 407 percent since 1996.

There are now about 140 deep water discoveries of which more than 90 are producing. This has helped to increase total offshore production from 980,000 barrels per day in 1995 to 1.7 million barrels per day in 2003. Additional deep water rigs are being built or moved to the Gulf from other parts of the world. The number of deep water exploration wells drilled in 2004 increased 27 percent compared to 2003.

This steady advancement in deep water production over the last decade and for the coming decade would not be possible without major advances in offshore technologies that are truly amazing. Advances that allow remote control of drilling operations from control rooms that are miles away; dynamic positioning of drill ships using multiple engines that are the size of the meeting room we are sitting in; float-

ing production platforms with surface area the size of football fields; anchoring cables to hold facilities in place that are made up of a combination of traditional steel and synthetic materials; pipe laying ships that can lay miles of pipeline in thousands of feet of water. In fact, the recent Thunder Horse development required over one hundred technological advancements—things that had not been done before—to bring online the largest oil field discovered in the U.S. in the last 30 years.

The industry ingenuity that we see in deep water is the same approach that is being used in deep shelf drilling operations on the traditional shelf where operators are targeting deep natural gas reservoirs that require drilling 15,000, 20,000 and in some instances 35,000 feet deep through extremely high temperature and pressure conditions.

As we sit here, operators are drilling the Blackbeard project to more than 35,000 feet—6 miles. This well will take almost a year to drill and there is no ironclad guarantee of success.

Managing Other Uses

For much of the past 50 years offshore development has been largely focused on producing oil and natural gas. However, over the last decade MMS has nurtured the development of an OCS hard minerals program. MMS has established partnerships with 14 coastal states focusing on collecting and providing geologic and environmental information to identify and make available sand deposits in Federal waters suitable for beach nourishment and wetlands protection projects.

To date, more than 23 million cubic yards of OCS sand has been used in 15 projects that nourished 76 miles of shoreline in Florida, Louisiana, Maryland, South Carolina, and Virginia. Most recently, Florida has come back to MMS to identify possible OCS sand sources to repair coastlines damaged by the 2004 hurricane season, and Louisiana, which has lost half a million acres of wetlands to coastal erosion since the 1950s, has requested OCS sand to restore barrier islands and coastal wetlands.

The oceans may also hold the key to realizing significant potential new energy sources to support America's growing energy needs—for example: natural gas hydrates, and renewable energy such as wind, wave, and solar.

In addition, the oil and gas industry is contemplating ancillary projects, such as staging and emergency medical facilities, to support ongoing activities in the deep water Gulf of Mexico. MMS, as a leader in reviewing environmental and safety issues pertaining to facilities placed on the OCS, is actively providing guidance and review of the various new technologies and projects proposed for offshore areas.

MMS' expertise in resource assessment, regulation of offshore energy and mineral development, environmental protection, and design, fabrication, construction, operation, maintenance, and inspection of offshore facilities has put the Agency in the forefront of planning for appropriate government oversight for such projects.

For example, to support the increased need for liquefied natural gas (LNG) imports, and for safety and efficiency reasons, many proposed LNG terminals may be located on the OCS, with some terminals using existing OCS infrastructure such as pipelines, platforms, and salt cavern storage.

The U.S. Commission on Ocean Policy recommended the development of legislation providing for the comprehensive management of offshore renewable energy development as part of a coordinated offshore management regime. The Commission's report cited the Department's experience in managing the oil, gas, and mineral programs on the OCS as providing a successful management model for a wide variety of offshore activities. The Administration proposed legislation during the 108th Congress, which has been reintroduced this Congress, that would amend the Outer Continental Shelf Lands Act by establishing a uniform permitting process coordinated across appropriate Federal agencies, with DOI serving as the lead Federal agency. The Administration's proposed legislation would direct the Secretary of the Interior to establish an authorization process and regulatory framework for non-traditional energy projects including, but not limited to, renewable energy projects such as wind, wave, and solar energy. The Administration's bill would also authorize DOI to permit OCS facilities to be converted to other approved uses. The President's *Ocean Action Plan*, in response to the final report and recommendations of the *U.S. Commission on Ocean Policy*, calls for enactment of the Administration's proposal. The purpose of the legislation is to provide clear authority for oversight of energy-related activities on the OCS.

OCS Resource Assessments

OCS oil production could increase to as much as 40 percent by 2010. Its contribution is projected to grow significantly over the next few years as the OCS is believed to hold about 60 percent and 41 percent of the Nation's remaining undiscovered oil

and gas resources, respectively. It also may hold a potential future supply of methane hydrates that could, if it proves safe to develop, supply another important source of natural gas for domestic consumption.

MMS recently completed an interim update of estimates for undiscovered technically recoverable resources underlying the OCS. Our mean estimate is 76 billion barrels of oil and 406 tcf of natural gas, which is a 12 percent increase since 2000 for natural gas because of new information obtained from recent exploration in the Gulf of Mexico. MMS conducts a comprehensive national assessment of the undiscovered oil and gas resources on the OCS every 5 years. The main objective of these assessments is to forecast the oil and natural gas endowment of the U.S. OCS for planning purposes, but there is much uncertainty in the estimates for those areas which have been off limits to exploration and development for many years due to a lack of data. In portions of the eastern Gulf, the west coast and the Atlantic OCS, the last acquisition of geophysical data and drilling of exploration wells occurred more than 25 years ago.

Yet, in the interim there have been enormous advances in exploration and production technologies and a myriad of new drilling, completion, and production technologies that could be used in these frontier areas today. Additionally, worldwide, there has been an enormous amount of exploration and production activity in frontier offshore basins that would provide new geologic analogs and exploration and production insights to use in exploring frontier U.S. offshore basins.

The Nation's energy potential may not rest entirely on conventional hydrocarbon resources. Scientists are now studying the possibility that a unique and puzzling frozen "ice" crystal may hold the key to future energy resources. Methane hydrates are naturally occurring ice-like solids in which water molecules have trapped gas molecules. Hydrates are found in locations with high pressure and low temperature—over 98 percent of natural gas hydrate resources are estimated to occur in offshore ocean sediments. Discovering a method to locate, produce and transport the gas from formations to the market is key to their potential use.

The next MMS resource assessment, to be completed this summer, will also for the first time include a *preliminary* estimate of *technically recoverable* methane hydrate resource potential for the OCS. MMS is working closely with USGS to develop the methodology used in the hydrate assessment. In anticipation of industry's move to develop natural gas from methane hydrates, MMS is also developing a methodology for tract-specific resource economic evaluation for bid evaluation, mapping the Gulf of Mexico seafloor to assist in assessing hydrate resources, and funding studies on hydrates extraction technologies and their potential environmental impacts to facilitate development of environmentally protective measures. We are also participating in the Joint Industry Drilling Project (JIP) in the Gulf of Mexico. This project is a joint industry/Government research consortium to address the location and possible production of methane hydrates in the Gulf. Under the JIP, the consortium is now preparing to drill the first 2 boreholes in the Gulf of Mexico in order to assess drilling conditions.

Other information gathering efforts include the study of chemosynthetic communities that are associated with hydrate deposits, mapping the Gulf of Mexico seafloor to assist in assessing hydrate resources, and funding hydrate research activities conducted at the Center for Marine Resources and Environmental Technology.

5-YEAR OIL AND NATURAL GAS LEASING PROGRAM

The OCS Lands Act requires the Secretary of the Interior to prepare and maintain a schedule of proposed oil and gas lease sales on the Federal OCS that is determined to best meet national energy needs for the 5-year period following program approval. The 5-year program specifies the size, timing and location of areas proposed for Federal offshore oil and gas leasing. In order for a lease sale to be held on the OCS, the sale must be included in the 5-year program. To be on this schedule, the area must have been part of the multi-phased analyses required under section 18 of the OCSLA.

MMS's goal is to develop a program that is responsive to the Nation's energy needs, ensures environmental safeguards, and addresses public concerns. In developing the 5-year program, section 18 of the OCSLA requires that we analyze and compare areas of the OCS in terms of hydrocarbon potential, environmental sensitivity, and other factors. We also take into consideration laws and policies of affected coastal States.

MMS will soon commence the process for development of a new program for 2007-2012. Throughout the 2 to 3 year process of developing a new 5-year program, MMS consults with its constituents, ensuring that the program takes into account the con-

cerns of all parties. The MMS requests comments from states, local and tribal governments, American Indian and Native Alaskan organizations, the oil and gas industry, federal agencies, environmental and other interest organizations, as well as the general public. Consultation with affected parties also occurs at the local level through MMS regional offices.

The current 5-year program for 2002-2007 includes 20 sales in eight OCS planning areas—annual sales in the Central and Western Gulf of Mexico and periodic sales in part of the Eastern Gulf of Mexico, Beaufort Sea and Cook Inlet, Alaska. Three other planning areas in Alaska—Norton Basin, Chukchi Sea, and Hope Basin—also have sales scheduled if there is any interest expressed by industry at the beginning of the sale process. Part or all of nine OCS planning areas are currently withdrawn from leasing consideration by the President under section 12 of the OCSLA until 2012 and by annual Congressional moratoria. These include North Aleutian Basin (recently Congress voted to eliminate the North Aleutian moratorium but the Presidential withdrawal is still in place), Alaska; Washington-Oregon; Northern, Central, and Southern California; most of the Eastern Gulf of Mexico; and South, Mid, and North Atlantic.

PROTECTION OF THE ENVIRONMENT

MMS requires all operator plans for exploration and development have associated environmental documentation under the National Environmental Policy Act and they are also subject to CZMA provisions that allow review by coastal states. The OCSLA 1978 amendments mandated that the Department have a comprehensive environmental studies program to provide sound scientific analysis of the potential impacts of offshore development, and an Oil and Gas Information Program to provide offshore operators and Federal and State governments with data and information from OCS activities.

For example, in the Gulf of Mexico the development of deep water oil exploration and extraction has increased rapidly in recent years. During the last couple of years, strong bottom currents were reported during deep water exploratory operations. As a result, a series of deep mooring stations designed by MMS have been established to study the shelf/slope/rise dynamics to fill the information gap. One of the pilot studies for deep water currents was completed last year. The data collected included bottom pressure, velocity, temperature, and salinity depth profiles from various current meters and other sensors. After peer review of the findings, the results will be incorporated into our regulatory decision-making process and shared with all stakeholders.

In general the MMS regulatory requirements and monitoring of operations are specific and stringent concerning the performance of offshore oil and gas operations. For example, we require

- specific training for offshore workers in well control or production safety systems;
- installation, regular testing, and maintenance of drilling, production, and pipeline safety systems;
- submission for approval of exploration and development/production plans that include comprehensive environmental reports and oil spill contingency plans before operations start; and
- use of the best and safest technology available.

MMS also has a comprehensive accident investigation program followed by safety alert to all companies to prevent recurrence of similar incidents; and an effective and vigorous civil and criminal penalties program.

Over the past three decades, MMS has established an enviable environmental and safety record. We have seen the oil-spill rate continue to drop from decade to decade resulting in a 67 percent decrease over this 30 year period. Offshore production is one of the safest ways to provide for our nation's oil and natural gas energy needs.

SAFE OPERATIONS

The past five decades of experience and events have led the U.S. to a regulatory system that has a strong emphasis on environmental protection and safety of offshore workers. Indeed, the statistics show offshore to be one of the safer workplaces in America. The most recent MMS and Bureau of Labor Statistics data indicate that the offshore industry's injury and illness rate was almost 50 percent less than the petroleum industry as a whole.

The OCSLA mandates that MMS ensure safe and environmentally sound operations on the OCS through its regulations, including crucial and applicable applied

research that supports regulatory requirements relative to safety and pollution-free operations. A wide variety of laws, regulations, and other communications between MMS and industry govern all offshore oil and gas leasing, exploration, development, and production activities.

The MMS and the offshore oil and gas industry share the paramount goal of preventing offshore accidents. Both work cooperatively to protect the environment and to keep workers safe. MMS also promotes international cooperation for research and development initiatives to enhance the safety of offshore oil and natural gas activities and the development of appropriate regulatory program elements worldwide.

MMS has a permanent workforce inspecting offshore facilities for compliance with safety regulations and has particular expertise in the engineering, structural, and environmental issues related to building fixed facilities in the ocean. The MMS conducts over 20,000 inspections of offshore facilities a year and recently began an interagency partnership with the U.S. Coast Guard, in which MMS conducts inspections on behalf of that agency. The MMS also partners with Federal, state, and local agencies in standardizing oil spill plan requirements, response standards and in conducting regular drills. In addition, our comprehensive regulatory program includes:

- Technical and environmental reviews of all plans of exploration and development.
- A comprehensive program of inspection and enforcement which includes the issuance of civil and criminal penalties.
- Accident investigations, data collection, and analysis.
- An annual awards program that recognizes operators who conduct safe and environmentally sound operations.
- Technical research related to operational safety and oil spill response.
- Coordination with other agencies to ensure protection of our ocean resources as well as the Department of Homeland Security to ensure the security of critical assets.

To continue this admirable safety record, our goal is to use the “best available and safest technologies.” We must therefore continue to investigate technology, practices, and procedures that might further reduce risks to offshore workers and the environment. In that regard, our offshore program has benefited tremendously from our international research partnerships. For the past 25 years, we have worked with international agencies on offshore safety research projects—one quarter of our 529 safety and pollution prevention projects have involved international partners or contractors. Participating countries have included Canada, Norway, the UK, Sweden, Germany, France, Italy, Mexico, Brazil, Argentina, the Netherlands, Kazakhstan, Japan, Russia, Australia, and South Korea. This cooperation has enabled us to leverage our research funds and have access to the world’s leading technical specialists.

SCIENCE BASED DECISION-MAKING

MMS is committed to strong scientific research to ensure that decisions are based on the best available information. Reviewing environmental and technological issues that have been raised by state and local governments, other federal agencies, environmental groups, industry, as well as issues identified by MMS staff have helped shape our research agenda since the agency’s beginning. Working with colleges and universities, other federal and state agencies, and a variety of research firms, MMS identifies partnerships and opportunities to maximize research funding. Much of MMS research is accomplished through co-operative funding with universities, inter-agency agreements, and joint funding with industry.

MMS conducts research specific to issues associated with OCS mineral leasing and development.

- The *Environmental Studies Program* assesses the potential environmental risks of offshore development, provides information necessary to minimize any adverse risks, and provides a comprehensive database of baseline science that is critical to the OCS program decision-making. For example, MMS is working collaboratively with other agencies and academic and international experts to determine if offshore industry noise and marine seismic operations represent a threat to marine mammals and, if so, how to mitigate those effects. The *U.S. Ocean Action Plan* also recognizes MMS for its leadership in promotion of deep sea coral conservation and education through its ongoing survey of deep sea coral communities in the Gulf of Mexico.

- The *Oil Spill Research Program* provides information on oil spill response capabilities and conducts studies on spilled oil and its effect on the marine environment.
- The *Technology Assessment and Research Program* investigates and assesses safety and engineering related technologies. The results support the technology basis for MMS's permitting of drilling and production operations as well as other regulatory requirements.

The *U.S. Commission on Ocean Policy* in their final report to the President and to the Congress, acknowledged the role, and the success, of the MMS Environmental Studies Program (ESP). The Commission cited that the ESP "*is a major source of information about the impacts of OCS oil and gas activities on the human, marine, and coastal environments.*" To meet the increased demand for environmental information and to compensate for shrinking budgets, the MMS has aggressively sought opportunities to leverage its resources through partnering. For example, through close collaboration, the USGS continues to focus about \$2.5 million annually to meet some of the biological research needs of the MMS. MMS has also created research partnerships with universities in Louisiana and Alaska, leveraging federal funds on a one-to-one basis amounting to over \$3.0 million per year. MMS partners with other federal agencies including NASA, NOAA, EPA, DOE, and the Office of Naval Research on research projects when common interests exist, and recently has accomplished a number of its research objectives through leveraging opportunities under the auspices of the National Ocean Partnership Program.

This is a particularly exciting time for ocean science and resource management, and the MMS is in a unique position to participate with other agencies as a developer, implementer, and user of our Nation's (Coastal) Integrated Ocean Observing System (IOOS) system being planned today. MMS has been involved in the development and planning of this System from the beginning. The MMS is a charter member of the National Oceanographic Partnership Program (NOPP) and the Executive Committee of its Ocean U.S. office, which stemmed from a congressional request to NOPP's governing body, the National Ocean Research Leadership Council (Council), for "a plan to achieve a truly integrated ocean observing system."

Even as the IOOS is being developed, the MMS and its industry partners are already contributing. Due to a need for more site-specific data for forecasting ocean currents that may affect structural design, fatigue criteria, or daily operations, MMS established and implemented an ocean current monitoring and data-sharing program in the Gulf of Mexico. Under this program, deep water oil and gas platform operators will collect ocean current data from deep water drilling and production sites, and report to the National Oceanic and Atmospheric Administration National Data Buoy Center internet website making it publicly available to help ensure that OCS activities are conducted in a safe and environmentally sound manner.

Other ongoing MMS monitoring programs such as the Flower Garden Banks National Marine Sanctuary Monitoring Program, our Bowhead Whale Aerial Surveys, and our support for inter-tidal monitoring are well past the decadal mark and well placed to contribute to the biological components of IOOS.

MMS has been an active participant in Federal ocean efforts as a member of the National ocean partnership program and all of its subsidiary bodies. The *Ocean Action Plan* specifically recognizes its Deepwater Ocean Currents Monitoring Program as an important component of the proposed Integrated Ocean Observing System (IOOS).

MMS also supports the goal of advancing international ocean science and policy. MMS's expertise in managing OCS oil and gas and marine minerals has been acknowledged internationally. The MMS takes an active approach to identify and to become involved in international initiatives that promote better integration of safety and environmental concerns into offshore decision-making. To do this MMS focuses on:

- monitoring, developing, and refining safety and environmental standards;
- technical and information exchanges with our international regulatory counterparts; and
- providing technical advice to the U.S. Department of State.

CONCLUSION

The Department of the Interior remains committed to the production of traditional energy, as well as increased energy conservation, and alternative and renewable sources as critical components of the President's balanced, comprehensive policy. For this reason, the Department of the Interior has ensured that the OCS remains a solid contributor to the nation's energy needs. The relative contribution

from federal offshore areas will increase in the upcoming years due to activity in deep water areas of the Gulf of Mexico.

Regarding the longer term, I should note that there are long lead times for accessing frontier areas of the OCS. Lease sales cannot be held unless they are part of the current 5-year program. Once a lease sale is held, it could take 5 to 10 years for drilling to commence. Production could take another 5 years after a discovery. In a very real sense, regarding OCS policy decisions, there are few "quick fixes."

The environmental record of the OCS program is outstanding. There has not been a significant platform spill in the last 35 years. Natural gas production offshore represents one of the most environmentally sound energy investments this country could make. A decision to not produce OCS resources also carries consequences. Mostly, it will mean more imported oil and LNG. Mostly, it will mean more imported oil and LNG from countries with less stringent environmental requirements and increased tanker traffic into U.S. waters.

In this time of uncertainty, MMS stands ready to respond—to apply our best science, technical experience, and sound management principles to benefit the nation.

Mr. Chairman that concludes my statement. Please allow me to express my sincere appreciation for the continued support and interest of this committee for MMS's programs. It would be my pleasure to answer any questions you or other members of the Subcommittee may have at this time.

The CHAIRMAN. You may proceed, Doctor. Feel free to abbreviate your testimony. Please proceed.

STATEMENT OF DR. ROBERT W. THRESHER, DIRECTOR, NATIONAL WIND TECHNOLOGY CENTER, NATIONAL RENEWABLE ENERGY LABORATORY, GOLDEN, CO

Dr. THRESHER. Yes. Thank you. Thank you, Mr. Chairman.

I am pleased to appear before the committee as it considers the future of energy production on the Outer Continental Shelf. I am the Director of the National Wind Technology Center, which is located at the National Renewable Energy Lab and is DOE's primary renewable energy research organization. I will talk about wind and wave technology and some of the associated environmental concerns.

First with regard to wind technology, in the United States today there are 6,700 megawatts of wind installed. And worldwide, there are 47,000 megawatts of wind. It is one of the fastest new growing energy technologies. Offshore, the United States has no wind energy installed at this time. The European Union has about 600 megawatts installed. And they have plans to install about 50,000 megawatts of wind in shallow water in the Baltic primarily.

The U.S. offshore potential is fairly large for wind energy. Our estimates show about possibly 50,000 megawatts of potential wind in shallow water and 10 to 20 times that amount if you go to deeper water. So the United States is blessed with a huge amount of wind potential, both onshore and offshore.

For the United States to exploit this, we see the evolution of the technology and the R&D needed needs to proceed in three steps. Currently, wind turbines installed offshore are basically onshore turbines put on a tower and put in the water with a marinization package. And they are not cost optimized at this point, nor are they necessarily designed for all the environmental effects that are out there.

So the first step would be to optimize the shallow water turbines that are currently being used and then to move to slightly deeper water, say out to 60 meter, using some of the technology from our oil and gas friends to put them on towers. That needs to also be

cost optimized. The ultimate vision would be to go to deep water. And in deep water, we would probably float the turbines, maybe on a buoy or some kind of a platform. That is really an open issue at this point.

The vision would be in the longer term to be able to build the turbines and floating structures in a dry dock locally, float them into place, drop anchor, and plug it into a cable to shore. These would be installed in very large arrays to be cost effective. But that technology basically is not here today. It is probably 10 to 15 years off at the minimum.

Moving to wave technology, wave technology is currently in its infancy. And in Europe and to some degree in the United States, people are building and developing prototype machines.

In the U.K., there is an aggressive R&D program. And they have just commissioned the European Marine Energy Center on Orkney Island in Scotland where the first prototype is under testing now. They just started that in the last few months.

In the United States, the Electric Power Research Institute just completed a year-long research study on the feasibility of wave technology. And the next year they are working on tidal and current stream technology. They have been working with five Coastal States. And from the study, EPRI estimates shows that the incident wave energy flux for the United States is roughly equivalent to about 60 percent of the yearly electricity consumption. So it also is a fairly large resource.

Right now in the United States there is one prototype under development. Eight companies at last count were developing prototype systems someplace in the development stage. And my own opinion is that wave energy is about where wind was 20 to 25 years ago. I also believe that the wave energy has the potential over the long term to be as cost effective and competitive as wind is today.

Moving just for a minute to talk about environmental issues, wind and wave power generate no greenhouse gases. There is no fuel consumed. So they are environmentally sound in that sense. But you do have to worry about siting issues. As has already been discussed by the committee, visual acceptance is one thing, but interference with sea birds, marine life, visual noise, conflicts with other uses such as fishing, do come up. There is also sediment transport issues associated with the structures and some downstream blocking effects. You block the flow or you block the waves as you put these systems in.

However, preliminary environmental studies in the EEU have shown that there are no significant impacts due to wind energy. And the same is expected of wave, to be not an issue or at least a small issue.

The United States needs to start to investigate some of these wind and wave environmental issues to establish baselines and set the R&D, just as the oil and gas industry has done with Minerals Management Service.

So in conclusion, the U.S. is blessed with a great potential for both wind and wave technology, which is at this point not be harvested.

Thank you. I am open to questions at the committee's request.

The CHAIRMAN. Thank you very much.
[The prepared statement of Dr. Thresher follows:]

PREPARED STATEMENT OF ROBERT W. THRESHER, DIRECTOR, NATIONAL WIND TECHNOLOGY CENTER, NATIONAL RENEWABLE ENERGY LABORATORY, GOLDEN, CO

Mr. Chairman, I am pleased to appear before the Committee as it considers offshore hydrocarbon production and the future of alternative energy resources on the Outer Continental Shelf. The National Renewable Energy Laboratory (NREL) is the Department of Energy's primary laboratory for renewable energy and energy efficiency research and development. I am the director of the National Wind Technology Center at NREL. My testimony will address the opportunities and challenges facing offshore wind energy and wave energy development.

INTRODUCTION

Oil and gas produced on the Outer Continental Shelf have made significant contributions to the U.S. energy supply since the 1960s. Oil and gas offshore industries have developed technologies to overcome barriers resulting from increasing water depths, harsh ocean conditions, and growing environmental constraints to exploit the nation's domestic petroleum reserves. In a similar fashion, wind and wave energy technologies can make a significant contribution to the nation's domestic energy supply at a reasonable cost, while sustaining the environment by reducing emissions and strengthening our national security.

WIND ENERGY TECHNOLOGY

Wind energy is currently cost competitive in many areas of the country, producing electricity at 4-6 cents/kilowatt-hour (kWh) at good wind speed sites. Approximately 6,700 megawatts (MW) of wind capacity is installed in the U.S. Worldwide capacity is more than 47,000 MW. Building on this technology base, further development of offshore wind energy technologies has the potential to provide up to 70,000 MW of domestic generation capacity to the nation's electric grid by 2025, based on estimates using the National Energy Modeling System (NEMS).

European nations have announced plans for deployment of almost 50,000 MW of wind power in shallow offshore waters by 2025. NREL studies indicate more than 50,000 MW of shallow offshore resources (<30-m) are available near coastal load centers, and the resource in deeper waters is 10 to 20 times larger, as shown as shown in Table 1.

Table 1.—ESTIMATED U.S. OFFSHORE WIND ENERGY POTENTIAL

[Between 5 and 50 Nautical Miles from Shore]

Water Depth (Meters)	0-30	30-60	60-900	>900
Energy Potential (Megawatts)	50,000	200,000	500,000	250,000

The United States, however, has no direct experience with offshore wind turbines or the infrastructure to install them, and experience worldwide is still relatively limited. About 600 MW is currently installed offshore versus 47,000 MW installed onshore. No offshore turbines been installed in waters deeper than 20 meters.

To enable commercial exploitation of the domestic offshore wind resource at a competitive cost, research and development is needed to overcome current depth limits, improve accessibility and reliability, develop design methods, establish safety and environmental standards, and demonstrate the technology through testing and operational experience.

As illustrated in Figure 1,* the next technology step envisions a taller truss structure to support the wind turbine, allowing installations in waters up to about 60 meters.

The final and most difficult technology step allowing access to deeper waters requires R&D to develop floating platforms similar to those used for offshore oil rigs. This step would open vast sea regions for wind deployment and increase the wind resource potential to 750,000 MW, as shown in Table 1, for water depths less than 900 meters. The vision for floating platform systems is that they will be mass produced and assembled in a local dry dock facility, towed out to sea, anchored, and plugged into the electrical connector to an undersea cable that delivers the power

* All figures have been retained in committee files.

to shore. Through economies of scale and mass production at local U.S. shipyards, work at sea would be minimized, high paying manufacturing jobs would be created, and competitive energy costs could be achieved. The goal of an R&D program would be to achieve a 3 to 4 cents/kWh cost of energy by 2020.

There are significant advantages to deepwater floating turbine systems. They can be installed in higher wind regimes farther from shore where they will be out of sight and away from environmentally sensitive areas closer to shore.

In summary, the U.S. can begin tapping into the vast resource of offshore wind power on the Outer Continental Shelf (OCS) *today* to diversify our domestic energy sources and strengthen our national security.

WAVE ENERGY TECHNOLOGY

Wave energy is currently in its infancy. Although there are currently no commercial-scale installations that are similar to wind energy, a number of companies are developing prototype systems for sea trials and demonstration projects. These development activities are most active in Europe, where multi-million dollar R&D funding is provided by the European Union and individual countries. The United Kingdom is particularly interested in exploiting marine energy sources, and they have established an aggressive R&D program, including the recently commissioned European Marine Energy Center on Orkney Island for testing wave energy machines.

Wave power has significant potential in the U. S. as well. A recent study conducted by the Electric Power Research Institute (EPRI) estimated that the total incident wave energy flux for the U.S. is about 2,300 TWh/year, which is about 60% of the electrical energy consumption of the entire country.

The current status of development for wave technology is roughly equivalent to where wind energy was about 25 years ago. There are a wide variety of technologies with different physical operating principles under development both in the U.S. and in Europe. The first full-scale prototype wave energy machine is currently being sea tested at the European Marine Energy Center. In addition, two other wave energy machines are being tested, one in Denmark and another in Portugal. In the U.S., there are four projects at various stages of development, and one is undergoing ocean testing. At the time of the EPRI study, eight U.S. companies were developing wave energy generators.

Wave energy machines will need a sustained period of R&D. U.S. companies could benefit greatly from a comprehensive research, development, and operational testing program. These new prototype machines will need to be perfected and demonstrated to prove cost effectiveness and reliability, prior to large-scale deployment. With adequate R&D, wave energy systems have the potential to become as cost-effective and reliable as wind turbines.

ENVIRONMENTAL ISSUES AND PERMITTING

The most important environmental benefit from utilizing wind and wave energy technologies is that they generate no greenhouse gas emissions, or other pollutants. The environmental and security risks associated with the production and transportation of fuel are eliminated because no fuels are consumed. There are, however, several environmental issues that need to be considered when siting wind and wave facilities. The most important considerations are: interactions with marine life and seabirds, visual appearance and noise; conflicts with other uses of the sea space; construction and decommissioning impacts; changes in sedimentary transport in the local region; and low-energy zones downstream of the facilities that may be created by the use of the wind and wave energy. Preliminary European studies on offshore wind facilities indicate that these potential impacts are not significant, nor are they expected to be for wave energy projects. The U.S. needs to begin investigating these issues just as the oil and gas industry and Minerals Management Service have collaborated over the last several decades on offshore oil and gas production.

Environmental studies required for permitting are expensive and time consuming. More than three years are required to permit an offshore project in Federal waters. Due to the fact that renewable energy technologies are new and unfamiliar to these permitting agencies, the evaluation of issues and impacts lack hard data and scientific baseline studies. There are many regulations and agencies with no clear jurisdictional responsibilities making each state and project a unique case. The primary Federal agencies with ocean jurisdiction include: the Federal Energy Regulatory Commission, the U.S. Army Corp of Engineers, the National Oceanic and Atmospheric Administration and the Minerals Management Service. In addition, there is no "fast track" approval process for short-term demonstration and testing of projects.

CONCLUSION

Renewable electricity generation from wind and wave energy has significant potential for contributing to the country's energy supply and national security. However, major technical challenges must be addressed before this potential can be realized. Mr. Chairman, I appreciate the opportunity to testify before you today and I will be pleased to answer any questions the Committee might have.

The CHAIRMAN. Let me say the interest is obvious, but the time is short. So I am going to try to—I know the next panel is of great interest to a number of Senators. And we have a vote at a quarter of, which probably means we have to be out of here by 12 noon. And I do not think anybody will come back, because we both have meetings after that.

So what would you think of moving rapidly in terms of 2 minutes each on questions? Unless you did not give any opening remarks; then you can have a little bit more time. Is that fair enough? Is that all right?

Senator Bingaman, you can go first. I will go second. And we will go around.

Senator BINGAMAN. Thank you very much, Mr. Chairman. I thank all the witnesses for your testimony.

Let me try to just see if I—maybe this would be a question, I am sort of leading up to a question for you, Director Burton, I am trying to understand what the obstacles are to developing these resources offshore that we are all talking about. My understanding is there are two obstacles currently. One is congressional moratoria, which we enact. As I understand it, we enact it every year as part of the Interior appropriation bill. And that congressional moratoria covers a lot of States.

And then there are Presidential orders withdrawing lands from leasing. And we gave the President that authority under the Outer Continental Shelf Lands Act. We gave the President authority to withdraw lands from leasing. And the President has used that authority in several occasions. So those are the two big obstacles.

The proposal here is that we should pass authorizing legislation to authorize States to go ahead with leasing or make decisions to go ahead with leasing off their own shore. If a State desires to do that, I would think a more direct way to do it would be to just amend the language that we put in the Interior appropriation bill every year, which provides this moratorium.

The States of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, part of Alaska, Washington, Oregon, and California all are covered by this language in the appropriations act. It would be very easy to just put a proviso in there saying that this moratoria language does not apply to the State of South Carolina or New Jersey or whichever State wanted out. That would be the simplest way to eliminate the legal impediment to leasing off the shore of any State.

Am I right about that?

Ms. BURTON. Yes, sir. If the moratorium is lifted from a congressional viewpoint, then you still have the Presidential withdrawal in place. But because this administration is very mindful of the States' needs or wants, I think that the administration would seri-

ously again study its own withdrawal, if Congress signified that the State wanted to move off the moratorium.

This is the situation right now in the North Aleutian Basin in Alaska, where part of that basin was under congressional moratorium. It was lifted in September 2003 at the Alaskan delegation's request. We would like to study this area, if the President decides to consider changes to the Presidential withdrawal. So certainly that can be done that way, if Congress would like to do it that way.

Senator BINGAMAN. I see my time is up, Mr. Chairman. I had some other questions, but I will wait for another round.

The CHAIRMAN. And we all can submit questions. I think everybody wants to get something in.

Let me move to our side, and I will come back to myself. Shall we go in the order of arrival? Is that all right with everybody?

Okay.

Senator Alexander would be next on our side.

Senator ALEXANDER. Thank you, Mr. Chairman.

In continuing the discussion about the State option, Federal law treats States differently in terms of offshore production, as opposed to onshore production. For example, in Wyoming, if there is drilling on Federal lands, Wyoming gets a royalty of 50 percent of that before the money comes in to the Government. Alaska gets 90 percent.

Now, offshore, if you get beyond 9 miles, States get nothing from Federal lands. So our proposal was to give States 12.5 percent of that, which they might use to lower taxes or improve universities or whatever.

Admiral Watkins, this question is for you. It also suggests we take another 12.5 percent and create in effect a conservation royalty; the idea of taking some of the money that comes from drilling offshore and using it to fully fund the land and water conservation fund, wildlife preservation, or others.

In addition to that, Senator Landrieu and I have introduced legislation which we call the American Outdoors Act, which also relies upon a conservation royalty of about \$2 billion a year for coastal management of the type Louisiana needs, as well as other conservation purposes. Now as I understand your proposal, you would in effect create a trust fund funded by some of the money from offshore drilling, which we might call a conservation royalty. And it would go to help the ocean.

Does all of this seem consistent? One reason we call it a conservation royalty is we are trying to avoid the budget act. Because if the money comes into the State treasury or to the—or if it is a royalty and never gets here, then it is scored in a different way. And I will not get into all that. So this concept of a conservation royalty, I wonder if you would talk about that a little more and whether it is consistent with these other proposals that have been made to use these funds in that way.

Admiral WATKINS. Well, Senator, what we recommended was an ocean policy trust fund. And we debated long and hard about this. And we recognized that is very difficult to do. It does come under the appropriations control process up here in the Congress. But today, \$5 billion comes in annually from oil and gas revenues, basically, off the coast. Of that \$5 billion, \$1 billion is allocated. Land

and water conservation fund, some other—we would not touch any of that.

But to us, it is illogical. If we want an ocean policy that is integrated and cuts all these issues and brings them all to the fore, be able to fund that—and our total funding of the entire recommendation in this report was \$4 billion over current investment. That is about a 50-percent improvement in the investment in the oceans today, which we all agree is inadequate. Thirty-seven Governors agreed with that. Thirty-seven Governors said, “Give us a break. Do not give us unfunded mandate. We want to get some additional help from the Government to carry out these very complicated issues.”

So we said, “Let us set that up and grow over time into something that’s predictable.” The States can involve themselves up front in the planning process instead of being tail-end Charley on these issues. And these were unanimously supported. We went across the country to listen. So we came up with this fund.

Now some of the things you said, Senator, were very consistent with that. So, you know, I am not saying we have all the answers. I am just saying there needs to be a predictable source of moneys, if we are going to do this. Otherwise it is just superficial, fig leaf cover, rhetoric only, and we are not going to do anything. So I really believe that needs to be looked at.

I have talked to Senator Stevens, when he was still chairman of the Appropriations Committee, about it. He seemed to think it had some merit, although it was going to be tough. Everybody wants to go after those moneys. There is \$4 billion unallocated going into the treasury. We do not think that is the right way to put that money. We think it ought to be tailored to what Congress says.

And I think Senator Domenici said, “We ought to tell them how to do that.” We ought to protect it so it does not become an incentive for States to drill and break moratoria. California people are very worried about that, that somehow additional moneys flow back, we will break the moratoria. I do not think so. We have no indication that the States considered the \$1 billion that is allocated across the Coastal States to help them out from the current revenues that kept them from issuing the moratoria. So I do not know where that comes from. I think it is a red herring that is floated out there constantly.

So I think that what we have recommended here is the right thing to do. But I am not saying it is the only thing. I think what I heard you say was somewhat consistent with that, with that, with the trust fund concept.

Senator ALEXANDER. Thank you.

The CHAIRMAN. Thank you very much.

Let us see. We can move over the Democrat side.

Senator Landrieu.

Senator LANDRIEU. Thank you.

Admiral, you may want to qualify, or “clarify” is a better word, about this trust fund concept, because the core of what I think we are all working on, although we come from different viewpoints, is to try to open up opportunities in the Outer Continental Shelf, the appropriate opportunities for development and investment and conservation.

In some States, like Louisiana, Mississippi and Alabama, Texas, where we are more familiar with oil and gas drilling, we also want to do a better job of that, open up opportunities for wind and wave and new technologies. Since our States pioneered those technologies, we are well positioned to pioneer new technologies for using the resources in the Outer Continental Shelf.

But I would just like it if you could clarify the policy of the Oceans Commission, that you do think that some sort of revenue-sharing provision is important to the Coastal States. Is that why you included it in your report?

Admiral WATKINS. We made it very clear, Senator Landrieu, in our report. And it is in my longer statement for the record, a whole section devoted to the Ocean Policy Trust Fund. It is shared. It is a shared responsibility, we think, that the Federal Government has to be a good steward of the ocean, along with the States. The States have to do the hard work.

And as I said, they were very supportive of our recommendations here to get some kind of predictable money stream in there to come back to them to help them out, to carry out these varied provisions, because they are expensive.

So yes, it is shared. It is not one way. It is give back to the States at least \$1 billion of the unallocated moneys today. That is right off the bat to get going on this and to kick start it and really move out, and then gradually migrate up to the \$4 billion a year that are required to carry out an integrated national ocean policy, as was recommended, or something equivalent to that.

Senator LANDRIEU. Mr. Chairman, to briefly follow up on this point, as we come up with the details of this trust fund proposal that I think in large measure we all agree on, just not the details, thinking about sharing with the Coastal States on a production-based formula, but I mean production not just of oil and gas. But if you produce wind, you share in wind. If you produce tidal energy, you share in that. If you produce hydro, you share.

But as a producing State, I want to say for the record in this questioning, the other Senators can imagine the difficulty in Louisiana Senators, Texas Senators, Alabama Senators, and Mississippi Senators saying: Okay, we agree to do all the production of everything, but we are happy to share our money with everyone.

Now, you all understand we could not possibly sell that in Louisiana, Mississippi, Texas, and Alabama. So we have to come up with a way that each State can produce what it can and what it wants and then share those fairly. And that is just what I ask this committee to focus on, as we go down this path.

Admiral WATKINS. But, Senator Landrieu, one of the things we put in our report that was very clear is that it is not only the current oil and gas revenue stream that we are talking about here. It is the future revenue stream. There is no structure out there. There is no regime right now—

Senator LANDRIEU. Correct.

Admiral WATKINS [continuing]. Under which wind and thermal and all these other things can be brought in. Do you know what we are doing today? The Corps of Engineers has the sole responsibility off Cape Code under the Rivers and Harbors Act of whenever. And that has got to stop. I do not see how the States can bring

these kinds of new sources of renewable energy and everything else to bear without some kind of a framework that the Congress has laid. That is where the revenue stream can be identified. That is how this policy trust fund could be running.

It is a total package. It is not just a simple thing of sending—allocating some moneys down to through the trust fund. It is a matter of bringing this all together, getting all revenue streams identified, and do not allow entrepreneurs to go out there and not return to the American citizens what they should in Federal waters. So it is a total package. And I think we have a very extensive review of that in our “Ocean Blueprint for the 21st Century.”

The CHAIRMAN. Well, thanks for the answer. Thanks for the questions. We are going to move this as quickly as we can.

Senator Martinez, you are next.

Senator MARTINEZ. Thank you, Mr. Chairman. I will be very brief.

Ms. Burton, the offshore drilling in the Gulf of Mexico, the production, it seems, is moving in the direction of deep water oil, as opposed to shallow. And also I am sure you would understand the great concern of any potential for drilling in the future that would be close to the Florida coast.

With that in mind, would the Mineral Management Services support an effort by those of us who are concerned about drilling off Florida’s coast to buy back existing leases that are apparently mostly in shallow water and also fairly close to our Florida coast?

Ms. BURTON. Mr. Chairman, we—at this point, I cannot answer the question, because it is not a matter of the Minerals Management Service supporting it. It is an administrative position that has not been taken yet. But certainly we are aware of it. And we know exactly how many leases are there, and we can look at that. But the administration has not taken any position on that yet.

Senator MARTINEZ. So that would have to be a broader position than just MMS would—

Ms. BURTON. That is correct, sir. MMS cannot make that decision. This is an administration’s decision.

Senator MARTINEZ. In addition to that, I know we have talked about the potential for spillage and so forth. But would you agree that there are other environmental risks, environmental hazards, that come about as a result of drilling, such as the water that is withdrawn and other issues along those lines that create other environmental problems?

Ms. BURTON. There are certainly environmental problems, but they are studied before any license, any permit, is given out. And we have a whole group of scientists. We work very closely with NOAA, the National Oceanic and Atmospheric Administration. We ensure that there is enough mitigation of any issue that we see that the marine environment is kept safe. Not to say there are no issues, but we take care of them. And we think the regulations are such that it really is done very safely for the environment, as well as for the people, by the way.

Senator MARTINEZ. It mitigates them. It does not eliminate them.

Ms. BURTON. It mitigates it to a point where it is a fairly reasonable risk that we are taking. And I think that everything we do,

if there is any kind of impact, we mitigate it to where the impact is not lasting and not damaging.

Senator MARTINEZ. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much, Senator.

Let us see. Where are we?

Senator Feinstein.

Senator FEINSTEIN. Thank you very much, Mr. Chairman.

My question is for Ms. Burton. And it concerns the 36 Federal oil and gas leases offshore of California. These leases were issued decades ago, between 1968 and 1984. They have never produced oil and gas. They are mired in litigation. Two new marine sanctuaries have been established in the area that could be affected. California has maintained a complete statutory ban since 1995 on the areas surrounding the 36 leases.

I am told the following: Notwithstanding specific direction from the Ninth Circuit Court of Appeals to do a thorough environmental evaluation of the impacts of these leases, MMS has failed to prepare an environmental impact statement, failed to analyze the cumulative and future impacts of a decision to grant suspensions.

For example, the MMS failed to adequately analyze cumulative impacts and the effects of extending the life of existing platforms that the lessees propose to use—proposed to use and has failed to adequately address the need for new infrastructure for the leases, which cannot be developed from existing facilities.

Is it true that MMS again failed to comply with the National Environmental Protection Act in preparing its environmental assessments for the lease suspensions for the 36 leases? Is not failure to comply with NEPA the basis for additional legal actions that have been filed against MMS?

Ms. BURTON. Senator, as you very well know, MMS was under court order to prepare all the environmental assessments required under the court order that an extension of a lease is considered an action that needs to go through the NEPA process. We presented the court with a list of what we were going to do and a timetable. The court accepted it. I would seriously doubt that the court would accept something that is in violation of law.

We have done the environmental assessments. We have filed them with the court. And we are now waiting to see what the next step will be.

I want to also assure you that should there be any kind of activity on those leases, there are more environmental assessments that will be done. This was strictly for a temporary suspension of operations on the leases. But there would be more work done if they were to file, for example, an exploration plan or a development plan.

All along the way there would be new assessments done. And the State of California would have a chance to review them and decide whether they are acceptable or not.

What I do want to tell you also, Senator, regarding those 36 leases, the administration has agreed to buy them back. And we are in—we have been actually in negotiation for 3 years with the companies to buy the leases back. As we follow the court's path to do what is ordered in the *California v. Norton* litigation, on a parallel path we are trying to buy those leases back.

If we were to succeed in a settlement, the whole litigation becomes moot. The leases would go away. The Department of Justice is the lead agency for negotiation. The problem we are having is that the Department of Justice assessment of what those leases are worth and the company's assessment are so far apart that so far we have not been able to reach an agreement. We even went through mediation that was ordered by one of the judges. We are continuing. We have not given up. We are continuing our effort to buy them back.

The CHAIRMAN. Senator, your time is up.

Senator FEINSTEIN. Thank you very much. I appreciate your answer. Thank you very much.

The CHAIRMAN. Senator Murkowski.

Senator MURKOWSKI. Mr. Chairman, I will yield to my colleague.

The CHAIRMAN. Go ahead, Senator Allen, please.

**STATEMENT OF HON. GEORGE ALLEN, U.S. SENATOR
FROM VIRGINIA**

Senator ALLEN. Thank you, Senator Murkowski.

Mr. Chairman, thank you for holding this hearing. It is a very important issue. We need to become less dependent on foreign sources of energy. The Outer Continental Shelf is clearly an area of great interest where we can become less dependent and get increased production here, rather than relying on foreign gas or liquified natural gas, which costs more.

As you may know, Mr. Chairman and members of the committee, this has been an issue in Virginia, particularly this last year. And I am very much looking forward to putting out the real facts here in this committee and get this issue on the table. And I thank all our witnesses.

There is a lot of emotion on this issue. And there has been no one more knowledgeable and articulate in Virginia than a State Senator, who I want to introduce, who will be on the second panel. I am going to have to leave. And that individual is State Senator Frank Wagner from Virginia Beach.

You have chosen a great witness to testify today. He has a long history in our Virginia General Assembly and honorable service to our country as well, as an engineering and diving officer in the Navy, success in the manufacturing industry, and he even has a bachelor of science degree in ocean engineering from the U.S. Naval Academy.

He introduced a measure and passed a bill in the General Assembly this year that surely showed his interest and the interest of the people of Virginia in clean, responsible solutions to the current energy crisis. He is well qualified for the task of speaking on the energy needs of manufacturing and the promising advances of OCS technology.

Senator Wagner's hearing will bring some insight. I was following that legislation. He understands how important this is for people who heat and use natural gas in their homes, as well as manufacturers and the jobs therefrom and the competitiveness of our country.

And so I am not going to ask any questions now of these witnesses. But, Frank, Senator Wagner, if you would just stand up, I

am just introducing you now. Thank you for taking your time to be here.

And, Mr. Chairman and members of the committee, thank you for bringing forward an outstanding witness for not only Virginia but the country.

The CHAIRMAN. Thank you very much, Senator.

We look forward to your testimony, sir.

Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman.

Very quickly to you, Ms. Burton. There has been so much concern and controversy over OCS development as it relates to oil, perhaps not so much concern and controversy over the natural gas. My question to you is whether or not you believe it might make sense for the Congress to consider permitting gas-only leasing in the OCS areas.

Ms. BURTON. There is no doubt, Senator, that gas does not pollute like oil might. And that is a lot safer type of activity from that standpoint. There are areas that are known as being gas prone. We feel, or at least our solicitor feels, that we do not at MMS, at Interior, have the authority right now to issue gas-only leases. Gas and oil are tied in the OCSLA statute. We would need some amendment to the statute to issue gas-only.

Is it something that we think should be done? I am really not qualified to tell you that at this point, because I think the people that are going to drill for it are the ones qualified to answer this question. And I think industry has to make that known to you.

Can they drill and produce only gas? And what happens when they find oil with it? Because a great percentage of the time, oil and gas are associated. And it would be very difficult to say, "I am going to produce only gas." What happens when you find oil?

I think the challenge for the MMS will be to find proper regulation to see how can we regulate drilling activities that may produce oil when they do not have an oil lease. So what do we do? Do we make them reinject it? How do we handle that?

This is something we will come to grips with, if Congress gives us the authority and shows a desire for gas-only leases. But I suspect the industry will have to tell you whether that is feasible or not.

Senator MURKOWSKI. Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much. That is an excellent suggestion, and we had better make some inquiries with reference to that, because we do not have time for another hearing on the subject. So we had better find out.

Now I think following along here, the next Senator would be Senator Thomas.

Senator THOMAS. Thank you, Mr. Chairman. I am not as familiar with this as I might be. We have relatively little offshore in Wyoming.

[Laughter.]

Senator THOMAS. But I do—we do have Federal land. So as you talk about where the money goes from these things, remember that Federal land and Federal water may be kind of the same. And it does not all go to the States where we are.

Johnnie, where do you think are the most likely areas for movement and production? And other than the law, what are the greatest obstacles to moving forward?

Ms. BURTON. Well, I think that besides the law and the moratoria, et cetera, you have the technological challenges that industry faces every day. They are going to new frontier areas, extremely deep drilling. There is a well being drilled right now that is trying to reach 35,000 feet on the Shelf. I do not know how they will reach it or when, but I think they think it will take at least a year.

There are challenges when you drill in extremely deep water. We hold the record in the Gulf of Mexico with a little over 10,000 feet of water. So these are some of the problems.

But I think that what I—at least when I talk to the people who do it—because, remember, MMS does not produce one barrel of oil or one MCF of gas. All we do is regulate the people who do produce it and, to some extent, facilitate that production.

When I talk to them, they tell me that the biggest obstacle they have is a lack of access. When you look at the OCS, and it is about 1.76 billion acres, we really have only about 40 million acres under lease at this point. But there is plenty of oil and gas in the Gulf of Mexico, as our production has proven in the last few years and the number of discoveries.

So I really think that technology is a big obstacle. But industry has shown that they are very capable of moving along into tougher and tougher environments. And of course, access is another issue.

The CHAIRMAN. Thank you very much, Senator.

Now we are going to have Senator Corzine and then Senator Salazar. And we will get the next—and I will have a question then.

Senator CORZINE. Thank you, Mr. Chairman. I appreciate very much you holding the hearing. And I have a statement for the record to be included.

The CHAIRMAN. It will be part of the record.

[The prepared statement of Senator Corzine follows:]

PREPARED STATEMENT OF HON. JON CORZINE, U.S. SENATOR FROM NEW JERSEY

Thank you for calling this hearing today Mr. Chairman, on this most important issue. Proper stewardship of our coastal areas and energy resources is vital for the continued health of our economic security and environmental stability.

For more than twenty years, a strong, bipartisan moratorium has protected coastal areas from offshore oil and gas development. This moratorium on the Atlantic Coast began with the support of President Reagan in 1982. It was later extended by President George H.W. Bush in 1990, by President Clinton in 1998, and is now set to expire in 2012.

It is my firm belief that this moratorium should be made permanent. Coastal tourism is New Jersey's second-largest industry, and the New Jersey Shore is one of the fastest-growing regions in the country. Tourism at the shore directly and indirectly supports more than 500,000 jobs, more than 12% of total State employment, generates more than \$16.6 billion in wages and brings in more than \$5.5 billion in tax revenues to the State.

In the last two Congresses, I introduced the COAST Act, which would make permanent the moratorium on oil and gas leasing activity in the Mid-and North-Atlantic.

As all of my colleagues from coastal states know, keeping our shores free of drilling will not be easy. We have formed successful bipartisan coastal coalitions in the past to keep our shores clear of this kind of activity. In 2001, we fought off the Department of the Interior. And during the past few Congresses, we banded together to prevent Outer Continental Shelf inventory provisions from being adopted as part of the final Energy Bill.

It is clear that this moratorium has had bipartisan support for over two decades, yet since the beginning of this Administration, we have seen efforts to weaken this moratorium under the guise of trying to reduce U.S. dependence on foreign oil.

Increasing domestic energy production is, of course, a necessary component of a balanced energy policy. However, considering the minimal amount of oil and gas resources located in the Mid-Atlantic outer Continental Shelf—estimated in 2000 by the Minerals Management Service to be approximately 196 million barrels of oil, enough to last the country barely 10 days—I am concerned a rush to open up the Atlantic Coast may result in economic consequences that far outweigh the benefits.

I urge my colleagues and the Administration to protect these vital coastal communities across the nation by continuing to oppose any effort to weaken the moratorium on new mineral leasing activity on submerged lands of the Outer Continental Shelf.

Senator CORZINE. Unlike Senator Thomas, New Jersey has just a little bit of shoreline—127 miles of it. And the second largest industry in our State is tourism. So there is more than just a little concern in New Jersey with regard to the issues of offshore drilling.

And the point that Ms. Burton just made with regard to intermixing of oil and gas, if you were to take one approach, it is certainly a concern to our citizens, as are a number of things.

I have actually been listening to the hearing in my office. And, Admiral, you talked about what you thought was stated in your Ocean Blueprint with some incoherency with regard to our overall management of policy relating to coastal and ocean areas. If we were to follow the approach that is contained in the language known as SEACOR, would that contribute—

Admiral WATKINS. Language? I am sorry, Senator.

Senator CORZINE. SEACOR is an attempt to devolve more of the authority for offshore drilling and exploration to the States. What kind of impact would that have with our overall management of coastal and ocean efforts?

Admiral WATKINS. I do not know that I can answer that, Senator. You know, we had a very clear line given to us in Oceans Act 2000. We debated on this commission throughout. Can we cross the line into energy generation? And I kept saying, “No, we cannot.” It was never in our mandate to do that.

I was the Energy Secretary. I understand the energy problem. And I understand the interaction with energy and our ocean policy. So I have to stay pretty much out of any specifics like that. I would love to have the capacity to get into something like that, because it seems to have potential merit. On the other hand, I am so worried about the fact we have no regime offshore at all that to throw anything into the mix without having some overall congressional policy and regime setup would be a mistake. That is all I can go on from my commission experience.

Obviously, I have some personal views that are really irrelevant at this point. I am an old, antique Energy Secretary, been out of the business for 14 years. So I think that I would have to stop there, Senator Corzine. I would love to be able to answer you, but I cannot do it.

Senator CORZINE. I appreciate your work on raising the issue that the overall policy needs to be established, which I think is fundamental.

Thank you.

The CHAIRMAN. Senator Salazar.

Thank you, Senator Corzine.

Senator SALAZAR. Thank you. Let me first of all just say welcome to the panel and particularly to Dr. Thresher from NREL. I appreciate you being out here. And all of us, I know, on this committee appreciate the great work that NREL is doing for our country, especially as we deal with the huge energy challenge.

My question for you simply is this: With respect to wind and power technology, and the offshore development of those two technologies, what more could we be doing as a country to further explore those technologies? And what is the realistic possibility, especially with respect to wave energy, of ever being able to look at that as a useful energy source for the nation?

Dr. THRESHER. Thank you, Senator. Right now our activities at NREL are almost totally directed at land-based technology. And that is where the emphasis has been. We have very small—less than 10 percent of the wind budget is going toward looking at offshore. And as the oil and gas folks know, it is very expensive. It is difficult in the environment.

And so some expanded R&D in that activity, as I mentioned, kind of first optimizing the shallow water technology, much in the same way the oil and gas industry has done, shallow water, intermediate depths.

But the ultimate vision is to be able to float the technology, get it out of sight, kind of over the horizon, where the winds are better and it does not interfere with the environment quite as much out in the deep waters.

So with regard to wave energy, it is absolutely in its infancy. There are only prototype systems around. There is no Federal program to support those activities, no R&D. It is all company sponsored. And it is a little bit fragmented, as opposed to in the U.K., where there is a concerted effort to develop that technology.

And as I indicated, the incident energy in waves coming into this country is about, on a yearly basis, 60 percent of the electric consumption in the year. So there is a large resource potential. But it will take time and money to—and a sustained effort over at least 10 to 15 years to bring that to fruition.

Senator LANDRIEU. Mr. Chairman, I know we have to move to the other panel, but could I just get on the record, since several members have mentioned the distance from the shore, to keep out of eyesight the production of whatever we are going to try to produce, what is the distance? Is it 10 miles, 15 miles, or 25 miles that the human eye can see?

The CHAIRMAN. You are speaking of wind now?

Senator LANDRIEU. Speaking of any kind of production platform, how far do you have to be offshore to not see it?

Ms. BURTON. From an oil and gas viewpoint, a production platform is not visible after 15 miles.

Senator LANDRIEU. Would wind be visible after 15 miles?

Dr. THRESHER. At 5 miles, it looks like on the horizon about my finger, about an inch as to how—

Senator LANDRIEU. So 15 miles, you could not see it at all.

Dr. THRESHER. Fifteen miles with a little bit of haze, you could not see it.

Senator LANDRIEU. Okay.

The CHAIRMAN. I just have two questions, one first for you, ma'am. First I want to tell you what a good job I think you do, and I hope you stay with us, as we try to sort through this policy.

Ms. BURTON. Thank you, sir.

The CHAIRMAN. When you give us our estimates of what the resources are out there, when—nobody will let us adopt the policy that says "Let us go on and do a real, current, best technology estimate of the resources," where every time we talk about it, it is the end of the world. But I note that whatever estimates you all have given us have been always on the low side versus reality.

Is it fair to assume that the estimates you are giving us are vested with the same quality?

Ms. BURTON. Yes, sir.

The CHAIRMAN. So if we are looking out there, we probably could expect more resources rather than less from these offshore resources?

Ms. BURTON. I think so. And until we get more drilling and more exploration, there is no real knowledge. The Gulf 10 years ago looked like it was a dead province. Look how much it is producing today.

The CHAIRMAN. Yes. My second question is: I am now knowledgeable about the dramatic change in technology in on-land development of oil and gas from drilling from 25 years ago, Prudhoe Bay 1 to Alpine 1 in Alaska. The same increase in technology, has that occurred in offshore drilling, also?

Ms. BURTON. I think it is as much or more. It is incredible what is happening offshore today. I just went to a platform that had 100 new technological advances. It is absolutely on a par with the space program.

The CHAIRMAN. So does that mean from the footprint being this platform, that you go out long distances with many, many drills off of one platform, as compared with many more than we did when you started the program?

Ms. BURTON. Yes, sir. They can go drill holes from a drill ship and then the drill ship moves away, then they put in a production platform. And they can tie in several fields long distances away from the platform, up to 50 miles away. So fields that might be even marginal and could not have their own platform, which would not be economical, now can be produced because they are all tied back to one central platform. One footprint, five fields.

The CHAIRMAN. Now both you and Admiral Watkins have alluded to the pollution risk. Admiral, you talked about the fact that there is the real risk and the perceived risk, I think, of spills. And you talked about what you found, what your commission found, versus what some environmental group that you mentioned was using. Would you state that again? I do not remember what you said.

Admiral WATKINS. What I said, Mr. Chairman, was that I believe, because of the technological advances that have been made in 25 years since the blowout in Santa Barbara, that we need to review those kinds of things on the basis of the kind of technology explosion that we have had in this interim period. It is impressive.

I have been out on the deep rigs in the Gulf that were then drilling to 5,000 feet. The environmental sensitivity, I can tell you, is as high there as it is anyplace in the country. Those people are

worried about the environment. They also want to preserve and have sustainable oceans around them.

You cannot shut the drill—as you know, you cannot shut a drill platform down now, because they are fish habitats.

The CHAIRMAN. Right.

Admiral WATKINS. So we have learned a lot over time about these things. And I say perception is—it is not that there is not a risk. It is just that to stay on the same old issue, whether it is Exxon Valdez or whether it is a blowout off Santa Barbara or some tanker off the coast of France, we have got to start thinking about: What is it 25 years later? It is a different ball game.

And I just say periodically, as I recommended when we built the energy strategy in 1991, we should take the energy bill that came out of that in 1992 and we should have upgraded every 5 years, because of the technology explosion. Did we do it? No. We have not had a policy now since 1992.

The CHAIRMAN. We are going to do it now.

Admiral WATKINS. We have to do it now. So this is the problem I have with perception versus actual. I think actual changes over time, and perceptions do not. That is the problem.

The CHAIRMAN. Yes. The problem in that regard is that even if we have the reality rather than the perception because of the new changes, those who are opposed use the old evidence and continue to tell the public it is the current evidence. And so it is a great PR battle. And it is a question of who has the facts. And I do not think it can be doubted that the transition period has caused it to be much, much safer, rather than less, and it is obvious. But yet some will not acknowledge it at all. So we are going to proceed.

My other observation for you, Admiral, as you discuss this trust fund concept, which you understand is very difficult to do—I know it better than you because I know what the budgets are all about. And it is hard to set up a trust fund. And it is clearly hard for this kind of committee to set one up. I guarantee you. First you have to get it into the budget. And that is a devil. And then you have to follow it and put it in some kind of mandated approach.

But it does seem to me that there is a fallacy in your argument, in the rationale of your argument, that you should take a very large portion of the new money that will come from offshore drilling and put it into a trust fund for the purpose you say, in that the relationship of how much of the ocean problem has been caused by drilling is certainly not established.

It is not as big as the proportion that you are going to take of the royalty. In other words, if there is a problem in the ocean, how much of it is caused by drilling? And it is probably small. If you are suggesting that we should take a huge portion of the royalty and apply it to that problem, I am saying we should apply it, but I do not know if we should apply as much as you say, based upon just common reasoning about which contributed to the problem, what contributed to the problem.

I just throw that out. I do not mean to be argumentative.

Admiral WATKINS. No. I think you made a good point, Mr. Chairman. You know, we were talking about the existing revenue flows. Only \$1 billion goes back to use for work——

The CHAIRMAN. Right.

Admiral WATKINS [continuing]. And the rest goes into the Treasury's slush fund. Okay. I am just saying there is a logic to taking the same revenue stream and apply it back to the oceans which surround these platforms.

The CHAIRMAN. You are right.

Admiral WATKINS. I think the Gulf of Mexico is taking the heavy load for this country and all of the others that will not have a refinery, will not have any sources, all griping about it. They do not mind the Gulf States taking the burden environmentally. So I believe there is a need to go back and use these funds for that purpose.

I think it is a tribute to the stewardship ethic that we are trying to build in this country, that we should be good stewards of that ocean. And I think that this is a source, one source, of revenue that has a logic train. It is called the oil and gas business. It has matured. It has been there for years. And we ought to capitalize on it.

The CHAIRMAN. Thank you. Thank you, panel.

We are going to proceed to the next panel.

Senator LANDRIEU. And, Mr. Chairman, just for the record, it is a \$1 billion authorization. But last year the actual money was only, I believe, around \$450 million. So I just want to clarify for the record that it is a \$1 billion authorization, but we never hit that mark. And it was only about \$400 million.

The CHAIRMAN. That is true. It enhances his argument more, even more so.

All right. Next panel, please. We do not have but 10 minutes, because there is a vote up. But we are going to do this. And we are going to ask them to hold the vote.

Is there a vote following this vote? Could you find out?

Okay. I am very sorry about the time problem. In the event we cannot get enough done here, would each of you tell me, starting right there, ma'am, the Sierra Club, if we waited until after lunch, could you come back?

Ms. BOGER. Yes, sir.

The CHAIRMAN. Okay. And how about you, sir?

Mr. ANGELLE. Yes, sir.

The CHAIRMAN. I have a 2:15 here and here. Could you be back at 1:30?

Senator ALEXANDER. Mr. Chairman, I will do my best. I am supposed to be—the Foreign Relations Committee is considering Mr. Bolton this afternoon. And I need to be at that when they vote. Otherwise I will be here.

The CHAIRMAN. Okay. How about—can any Democrats be here at 1:30? I should ask that.

Why do we not do that? Let us go right now until 12 o'clock. If we do not get enough in, we will just recess until 1:30, quarter of 2, and do another 30, 40 minutes.

Please proceed. Let us start right with you, and you can give your testimony. Whatever you have in writing will be made a part of the record. We would appreciate it if you would try and summarize it.

**STATEMENT OF DEBBIE BOGER, DEPUTY LEGISLATIVE
DIRECTOR, SIERRA CLUB**

Ms. BOGER. Good morning. My name is Debbie Boger. I am the deputy legislative director of the Sierra Club. And I am here representing over 750,000 members nationwide. Thank you for the opportunity to testify, Mr. Chairman.

The Sierra Club strongly opposes any moves to open the moratorium areas of the Outer Continental Shelf to drilling for hydrocarbons of any sort, including both oil and natural gas. We oppose lifting the moratorium for six reasons.

First and most importantly our beaches and coastlines are special, irreplaceable places. It is our responsibility to protect them. And the existing moratorium is the primary tool we have used to protect them for over 20 years now.

Second, allowing drilling off our coasts would have very damaging consequences for our beaches, for marine life and its habitat, and for the broader environment.

Third, the National Academy of Science has determine we do not have enough information to ensure that the environment will be protected if we drill offshore.

Fourth, drilling for oil and gas could have serious consequences for local tourism and fishing economies.

Fifth, there is no need to sacrifice our coasts in search of natural gas. Most of the natural gas estimated by MMS as recoverable is already available for leasing. So there is no justifiable reason to turn to our special places for drilling.

Finally, there are smarter ways that we can and should address our energy needs rather than allowing our coastlines to be threatened with oil and gas drilling.

While there have been significant advances in oil and gas recovery technologies in recent years, many serious consequences still result from exploration and drilling for either oil or natural gas. Seismic surveys, which are an inventory technology, have been linked to numerous whale beachings, making fish deaf, and rupturing swim bladders.

People might think, "Well, who cares if a fish is made deaf?" But fish use their hearing to locate prey, avoid predators, communicate, and sense their surroundings. So essentially what we are talking about is killing huge numbers of fish. Salmon are one example of vulnerable fish with swim bladders.

Other exploratory technologies have been shown to be extremely destructive to marine life and habitat. There are also serious consequences onshore from the extensive web of pipes in sensitive areas like marshes and wetlands.

In addition, exploratory drilling for oil or gas generates serious air and water pollution. These are numbers from the 2000 lease sale of 181 in the Gulf of Mexico. An average exploration drill well generates about 50 tons of nitrogen oxides, 13 tons of carbon monoxide, 6 tons of sulfur dioxide, and 5 tons of volatile organic hydrocarbons, all released into the air. And an OCS well will also generate about 180,000 gallons of mud waste and drill cuttings and hundreds of thousands of gallons of water containing pollutants like mercury, benzene, arsenic, and lead, and can contain varying amounts of radioactive pollutants.

There is also the serious, but not well known or well debated, threat of methane hydrate concentrations in the OCS.

Methane is 20 times more potent as a global warming pollutant than carbon dioxide. So the release of these hydrates could be very dangerous.

The National Academy of Sciences found in 1981, after a study at the request of Former President Bush, that there is insufficient scientific data available to permit leasing in the moratorium areas and ensure that the environment can be protected.

The industrial nature of oil and gas drilling often is at odds with the economic base of coastal communities, which rely on tourism and marine industries like fishing. In the case of the recent Virginia bill, which we will hear about, both the Outer Banks Visitors Bureau in North Carolina and the Virginia Beach Hotel/Motel Association oppose the bill because of their concern for the effects on tourism.

We submit that there is no need to look to additional natural gas or oil resources because enough is available already. Eighty-five percent of Federal onshore oil resources and 88 percent of Federal onshore natural gas resources in the Rocky Mountain region are already available for leasing and development. Only 12 percent of Federal onshore natural gas resources are off limits to leasing. Eighty percent of the national economically recoverable OCS gas is located in the central and western Gulf of Mexico, which is not subject to moratorium.

Importantly, instead of drilling off our coasts, there are smarter, cheaper, and faster solutions for rising gasoline and natural gas prices. The United States has about 5 percent of the world's population, but we consume about 25 percent of the world's energy. There is no way we can drill our way to energy independence.

The Union of Concerned Scientists found that by getting 20 percent of our energy from clean sources, like wind and solar, we can reduce natural gas consumption by 6 percent by 2020. This step will save more than all the natural gas off the Pacific Coast. Increasing renewables and efficiency would cut consumers' energy bills, encourage innovative and new technology, create jobs, and decrease our reliance on foreign sources of energy.

In conclusion, we are at a crossroads in terms of how we produce energy for our country. There are those who believe we should open up remaining wild and special places to drill for oil and natural gas. We are seeing efforts to open the Arctic Refuge, record applications for permits to drill in the West, and proposals to open our shorelines for drilling. This adds up to an approach where few places, no matter how special they are, are off limits to oil and gas.

There are, however, places, that are too special to develop. I believe we need to make a choice now for a future where our beaches and offshore waters are free of oil and gas drilling.

Thank you very much.

The CHAIRMAN. Thank you very much.

[The prepared statement of Ms. Boger follows:]

PREPARED STATEMENT OF DEBBIE BOGER, DEPUTY LEGISLATIVE DIRECTOR,
SIERRA CLUB

Mr. Chairman and members of the Committee, good morning. My name is Debbie Boger, and I am the Deputy Legislative Director of the Sierra Club. I am here rep-

resenting over 750,000 Sierra Club members who belong to more than 65 chapters and 450 groups nationwide. We are the largest environmental grassroots organization in the country. I'm very appreciative of the opportunity to testify this morning on the question of oil and gas activity on our Outer Continental Shelf (OCS).

SIERRA CLUB OPPOSES LIFTING THE COASTAL DRILLING MORATORIUM AND SUPPORTS
PERMANENT PROTECTIONS FOR BIOLOGICALLY SENSITIVE MARINE HABITATS

Sierra Club strongly opposes any moves to open the Outer Continental Shelf to drilling for hydrocarbons of any sort, including both oil and natural gas. We believe instead that there should be permanent protections for biologically sensitive marine habitats. We oppose lifting the existing moratorium for a number of reasons. First and most importantly, our beaches and coastlines are special, irreplaceable places. It is our responsibility to protect them, and the existing moratorium is the primary tool we have used to protect them for over 20 years. Second, allowing drilling off our coasts would have very damaging consequences for our beaches, for marine life and its habitat, and for the broader environment. Third, any Congressional decisions about drilling for oil and gas off our coasts should be based upon accurate science, and the National Academy of Science has determined we do not have adequate information about appropriate steps yet. Fourth, drilling for oil and gas could have serious consequences for local tourism and fishing economies. Fifth, there is no need to sacrifice our coasts in search of natural gas. Most recoverable natural gas estimated by the Minerals Management Service is already available for leasing, so there is no justifiable reason to turn to our special places for drilling. Finally, there are smarter ways that we can and should address our energy needs rather than allowing our coastlines to be threatened with oil and gas drilling.

LIFTING THE OCS MORATORIUM WILL HAVE DAMAGING CONSEQUENCES FOR OUR
BEACHES, FOR MARINE LIFE AND THEIR HABITAT, AND FOR THE BROADER ENVIRONMENT

Damage to Marine Life and habitat: While there have been many advances in oil and gas recovery technologies in recent decades, many serious consequences still result from exploration and drilling for either oil or gas.

Seismic Surveys

The first step to drilling for oil and gas involves doing an inventory of estimated resources. One technology used for this type of inventory is a "seismic survey." This technology involves ships towing multiple "airgun" arrays with tens of thousands of high-decibel explosive impulses to gather geologic profiles of seabed rock structures. These airgun arrays fire regular bursts of sound at frequencies in the range of 20 to 150 Hz, which is within the auditory range of many marine species, including whales.

Marked changes in behavior in marine species in response to loud underwater noises in the ocean have been well documented. Seismic survey devices and military sonars (which operate at a similar decibel level) have been implicated in numerous whale beaching and stranding incidents, including a December 2001 mass stranding of 16 whales in the Bahamas, an incident of Cuvier's beaked whales being beached and stranded in the Galapagos Islands and a more recent stranding in the Canary Islands.¹

The auditory organs of fish are particularly vulnerable to loud sounds such as those produced by survey airguns. As fish rely on their ability to hear to find mates, locate prey, avoid predators, and communicate, damage to their ears can seriously compromise their ability to survive.² In addition, mortality is possible in species like salmon that have swim bladders (the flotation organ that fish use to orient themselves vertically in the water), which have been shown to rupture on exposure to intense sounds.³

"Dart Core" Seabed sample extractions

"Dart core" sampling, another survey technique, consists of dropping large hollow metal tubes from ships to vertically puncture the seafloor. The samples are retrieved and analyzed for information about subsea rock structures. This technique is extremely destructive to seafloor benthic organisms and fish habitat, discharging

¹NMFS, NOAA Fisheries Status Report: Preliminary Findings on the Stranding of Beaked Whales in the Bahamas (June 14, 2000); NMFS, NOAA Fisheries Status Report; NMFS, NOAA Fisheries Status Report on the One Year Anniversary of the Stranding of Beaked Whales in the Bahamas (Mar. 26, 2001).

²McCauley, R.D., J. Fewtrell and A.N. Popper, 2003. "High intensity anthropogenic sound damages fish ears." *J.Acoust.Coc.Am.* 113, January 2003.

³Id.

silt plumes that are transported on ocean currents and smothering nearby life on the seabed.

Seafloor "Grab samples"

"Grab samples" are retrieved from the seafloor sediments with large hinged "buckets" dropped from the shipboard into the seafloor to analyze silt, rocks, and seabed sediments and seafloor organisms. These buckets damage benthic organisms at the seafloor and cause silt plumes.

Directional Drilling

Directional drilling has been used to access oil and gas reserves under our National Parks, the Great Lakes, and the Gulf of Mexico. In the case of drilling offshore, the well head is on shore while the bottom of the well may be thousands of feet offshore. In 1997, Governor Engler of Michigan directed the Michigan Environmental Science Board to study the impacts of directional drilling on environmental and human activities. This study concluded impacts from directional drilling could result in the contamination of groundwater aquifers and loss of habitat while also increasing noise levels, odor, and congestion, impacting recreation and tourism.⁴

Onshore damage: The onshore infrastructure associated with offshore oil or gas causes significant harm to the coastal zone. For example, OCS pipelines crossing coastal wetlands in the Gulf of Mexico are estimated to have destroyed more coastal salt marsh than can be found in the stretch of coastal land running from New Jersey through Maine.⁵

Water pollution: Drilling muds are used to lubricate drill bits, maintain downhole pressure, and serve other functions. Drill cuttings are pieces of rock ground by the bit and brought up from the well along with used mud. Massive amounts of waste muds and cuttings are generated by drilling operations—an average of 180,000 gallons per well.⁶ Most of this waste is dumped untreated into surrounding waters. Drilling muds contain toxic metals, including mercury, lead and cadmium. Significant concentrations of these metals have been observed around drilling sites.⁷

A second major polluting discharge is "produced water," the water brought up from a well along with oil and gas. Offshore operations generate large amounts of produced water. The Minerals Management Service estimates that each platform discharges hundreds of thousands of gallons of produced water every day.⁸ Produced water typically contains a variety of toxic pollutants, including benzene, arsenic, lead, naphthalene, zinc and toluene, and can contain varying amounts of radioactive pollutants. All major field research programs investigating the fate and effects of produced water discharges have detected petroleum hydrocarbons, toxic metals and radium in the water column down-current from the discharge.⁹

Air pollution: Drilling an average exploration well for oil or gas generates some 50 tons of nitrogen oxides (NO_x), 13 tons of carbon monoxide, 6 tons of sulfur dioxide, and 5 tons of volatile organic hydrocarbons. Each OCS platform generates more than 50 tons per year of NO_x, 11 tons of carbon monoxide, 8 tons of sulfur dioxide and 38 tons of volatile organic hydrocarbons every year.¹⁰

Global Warming pollution: Methane hydrates are ice-like structures formed from frozen water and methane. These structures are found in Arctic permafrost and beneath the seafloor of the Outer Continental Shelf where water depths are greater than 500 feet. The Congressional Research Service reports that "safety problems related to gas hydrates may be anticipated. Oil and gas operators have recorded numerous drilling and production problems attributed to the presence of gas hydrates, including uncontrolled gas releases during drilling, collapse of well casings, and gas leakage to the surface." The report continues that methane hydrates easily become unstable, potentially triggering seafloor subsidence and catastrophic landslides. In addition, a single unit of methane hydrate can release 160 times its own volume in gas.¹¹ As methane is a greenhouse gas more than twenty times more potent than

⁴Long, D.T., W.E. Cooper, W.B. Harrison III, R.H. Olsen, B.J. Premo and K.G. Harrison. 1997. *Evaluation of Directional Drilling under the Great Lakes*, October 1997. Michigan Environmental Science Board, Lansing, Michigan.

⁵Boesch and Rabalais, eds., "The Long-term Effects of Offshore Oil and Gas Development An Assessment and a Research Strategy." A Report to NOAA, National Marine Pollution Program Office at 13-11.

⁶MMS, 2000. Gulf of Mexico OCS Oil and Gas Lease Sale 181, Draft Environmental Impact Statement (DEIS), p. IV-50.

⁷Id.

⁸Id., p. IV-32.

⁹Id., pp. IV-32-33.

¹⁰Id., p. IV-40.

¹¹Congressional Research Service, Report RS20050, "Methane Hydrates: Energy Prospect or Natural Hazard?" James E. Mielke. February 14, 2000.

carbon dioxide in contributing to global warming, this volume of gas release would be extremely dangerous.

Oil spills: If offshore areas are leased for gas exploration there is always the possibility that oil also will be found. There is no known example of a case where a lease prohibits an oil company from developing oil if oil is found in a “gas prone” region. There is no documented instance of any company ever agreeing to such a condition in the history of the OCS leasing program. Without such a restriction included in a lease there would be no assurances that oil would not in fact be developed, raising the possibility of an oil spill. According to statistics compiled by the Department of the Interior, there were some *3 million gallons* of oil spilled from OCS oil and gas operations in 73 incidents between 1980 and 1999.¹² Oil is extremely toxic to a wide variety of marine species, and as noted by a recent National Academy of Sciences study, current cleanup methods are incapable of removing more than a small fraction of the oil spilled in marine waters.

It is important to note that, with the exception of oil spills, the environmental damages described above result from drilling or exploring for either oil or *natural gas*, so any suggestion that restricting leases to natural gas drilling only will not adequately reduce risk of environmental impacts.

SCIENCE SHOULD GUIDE FUTURE CONGRESSIONAL DECISIONS ABOUT COASTAL DRILLING

The prestigious nonpartisan National Research Council (NRC) of the National Academy of Sciences (NAS) issued a peer-reviewed finding in 1991, after a year-long study conducted by this body at the request of former president George Herbert Walker Bush, Sr. The NAS found that there is insufficient scientific data available to permit leasing in the moratorium areas and ensure that the environment can be protected. The Minerals Management Service (MMS) Environmental Studies Program has done virtually no new work to fill these identified data gaps found within the OCS moratorium areas since the NAS study, in spite of the fact that the Congressional moratorium does not preclude this type of scientific research by the MMS Environmental Studies Program. Current concerns about the cumulative impacts of ongoing routine marine discharges of spent drilling muds, cuttings, and produced waters were highlighted by the recent late-2004 report of the President's own US Commission on Ocean Policy as a primary priority topic needing serious scientific evaluation.

DRILLING IN THE OCS COULD HAVE DAMAGING EFFECTS ON LOCAL ECONOMIES

The industrial character of offshore oil and gas development is often at odds with the existing economic base of the affected coastal communities, many of which rely on tourism, coastal recreation and fishing. In Dare County, NC, the Outer Banks Visitors Bureau has been fighting efforts to lift the ban on coastal drilling precisely because it realizes what a crushing effect coastal drilling could have on the Outer Banks' tourist economy. Carolyn McCormick, managing director of the Visitors' Bureau, was quoted in the *Virginian Pilot* last month saying, “If there's one spill or one disaster, you could destroy us for a very long time.”¹³ In Virginia Beach, the Hotel-Motel Association has supported the mayor's request to veto the recent bill to lift the drilling moratorium.

In addition to potentially catastrophic effects on the tourism industry, drilling for gas and oil off our coasts could have significant negative impacts on commercial fishing. In a Norwegian study conducted in the central Berents Sea, seismic shooting severely affected fish distribution, local abundance, and catch rates over a large geographic area. In this study, catch of cod and haddock fell precipitously within a 38-nautical-mile by 38-nautical-mile area, and remained depressed for at least five days following the conclusion of seismic survey activities.¹⁴

In addition, the Canadian T. Buck Suzuki Environmental Foundation and the United Fishermen and Allied Workers Union—CAW recently weighed in on the Canadian Statement of Practice on the Mitigation of Seismic noise, citing their concern for the B.C. marine-based industries, which employ over 20,000 and contribute over \$2 billion in revenues and \$600,000 in total GDP. These groups point to mortalities in fish eggs, fish and shellfish larvae, and adult fish with swim bladders; trawl

¹²MMS, 2000. Gulf of Mexico OCS Oil and Gas Lease Sale 181, Draft Environmental Impact Statement (DEIS), p. IV-50.

¹³The *Virginian-Pilot*, Norfolk, VA. Friday, March 25, 2005. “Offshore Drilling Issue Pits Energy against Tourism.” Page A1.

¹⁴Engas, Arill, Svein Lokkeborg, Egil Ona, and A.V. Soldal. Institute of Marine Research, 1996. Effects of Seismic Shooting on Local Abundance and Catch Rates of Cod (*Gadus morhua*) and Haddock (*Melanogrammus aeglefinus*). *Can. J. Fish. Aquat. Sci.* 53: 2238-2249.

catch declines from 50 to 70% and longline catch declines by 44% for 5 days after cessation of seismic shooting; and the particular concern about seismic activity during salmon migration or herring spawning. Salmon are of particular concern because of the endangered status of some populations off the Atlantic and Pacific coasts, and because of their apparent inability to detect and avoid low-frequency sound until damaging levels are reached.

PLENTY OF NATURAL GAS IS ALREADY AVAILABLE FOR LEASE AND PERMITTING

The majority of federal oil and gas resources are already available for development. According to the 2003 Energy Policy and Conservation Act (EPCA) report issued by the Department of the Interior, 85% of federal onshore oil resources and 88% of federal onshore natural gas resources (122.6 trillion cubic feet, or tcf) occurring on federal lands in Montana, Colorado, New Mexico, Utah and Wyoming are already available for leasing and development. Only 12% of federal onshore natural gas resources are off-limits to leasing.¹⁵ Eighty percent of the nation's undiscovered, economically recoverable Outer Continental Shelf (OCS) gas is located in the Central and Western Gulf of Mexico, which is not subject to the moratorium.¹⁶ Thus, a permanent protection for the coastal moratorium areas will leave the vast majority of the nation's OCS gas available to the industry.

In addition to availability for leasing, Bureau of Land Management (BLM) data indicates that the vast majority of federal lands currently under lease are not being developed. Of the more than 35,000,000 acres of public lands under lease, development is occurring or has occurred on approximately 12,000,000 acres.¹⁷ Drilling permit approvals on Western public lands by the BLM increased by 62 percent in 2004, to a record number of 6,052, while the number of new wells that were drilled declined by nearly 10 percent, to 2,702.¹⁸

Based on this data, it is clear that the vast majority of federal oil and gas resources occurring on federal lands in the Rockies are available for development. In addition, most of the leased lands are not in development, and the BLM has issued thousands more drilling permits than the industry is actually able to drill. The oil and gas industry clearly has plenty of access to our public lands already; there is no reason to grant access to additional areas currently under moratorium for additional leasing.

THERE ARE SMARTER, CHEAPER, AND FASTER SOLUTIONS FOR RISING GASOLINE AND NATURAL GAS PRICES

The United States has about 5% of the world's population but consumes about 25% of the world's energy. There is no way we can drill our way to energy independence. We must decrease our energy dependence by other means. Instead of opening up more of our lands to exploration and drilling, the Sierra Club proposes that we invest more time and money into clean energy solutions. A recent study by the Union of Concerned Scientists found that by getting 20% of our energy from clean sources like wind and solar by 2020 we can reduce natural gas consumption by 6% by year 2020. This step would save 20.6 Tcf cumulatively, more than all the natural gas off the Pacific Coast.¹⁹ According to an April 2005 study by the American Council for an Energy Efficient Economy, if we use technology available today to make our homes, buildings, and industry more energy efficient, we can save up to 12.6% of the natural gas they project we would be using by 2020.²⁰ Studies have indicated that implementing these programs would create thousands of new jobs and save consumers hundreds of dollars a year in energy bills every year.²¹ Promoting renewable energy and efficiency would also encourage innovation and new technology, reduce pollution, and decrease our reliance on foreign sources of energy.

¹⁵ BLM, "EPCA Inventory Fact Sheet," 1/15/03, p. 3

¹⁶ U.S. Department of the Interior, Minerals Management Service (MMS), 2000, Outer Continental Shelf Petroleum Assessment, 2000, page 5 and Gulf of Mexico Assessment Update.

¹⁷ BLM, "Total Number of Acres Leased" (unpublished table, January 31, 2005) and BLM, "Number of Producing Acres on Federal Lands" (unpublished table, January 31, 2005)

¹⁸ BLM, "Number of APDs approved by Year on Federal Lands" (unpublished table, January 31, 2005) and BLM, "Number of Well Spud During the Year on Federal Lands" (unpublished table, January 31, 2005)

¹⁹ Union of Concerned Scientists. Fact Sheet: "Renewable Energy Can Help Ease Natural Gas Crunch"

²⁰ Nadel, Steven. "A Choice of Two Paths: Energy Savings from Pending Federal Energy Legislation." April 2005. American Council for an Energy Efficient Economy

²¹ World Wildlife Fund: "Clean Energy: Jobs for America's Future" October, 2001 and Redefining Progress: "Smarter, Cleaner, Strong: Secure Jobs, A Clean Environment, And Less Foreign Oil" October 2004

THE PUBLIC SUPPORTS THE BAN ON DRILLING OFF OUR COASTS

Concerns over environmental consequences of offshore oil and gas development have led Congress to impose restrictions on OCS activities in sensitive areas off the nation's coasts every year since 1981. These moratoria now protect the east and west coasts of the U.S. and most of the Eastern Gulf of Mexico. The moratoria reflect a clearly established consensus on the appropriateness of OCS activities in most areas of the country, and have been endorsed by an array of elected officials from all levels of government and diverse political persuasions, including former Presidents George H.W. Bush and Clinton and the current President Bush.

CONCLUSION

Right now we are at a crossroads in terms of how we produce energy for our country. There are those who believe we should open up most remaining wild and special places to drill for oil and natural gas. We are seeing efforts to open the Arctic National Wildlife Refuge, record applications for permits to drill for oil and gas in the West, and proposals to open our shorelines to oil and gas drilling. This adds up to an approach where few places, no matter how special, are off limits to oil and gas drilling. My strong belief is that there are places that are too special to drill, and some of those areas are along our coasts and beaches. We can choose to set aside invaluable places to preserve for our children, or we can choose to open the majority of our country for oil and gas development. I believe we need to make the choice now for a future where our beaches and offshore waters are free of oil and gas drilling. There are appropriate places to drill and inappropriate places to drill. Our beaches deserve our protection as places that are inappropriate to drill. There are smarter and better choices we can and need to be making.

Thank you for the opportunity to testify to the perspective of the Sierra Club.

The CHAIRMAN. Let us now proceed to with Mr. Angelle.

**STATEMENT OF SCOTT A. ANGELLE, SECRETARY,
LOUISIANA DEPARTMENT OF NATURAL RESOURCES**

Mr. ANGELLE. Mr. Chairman, Mr. Ranking Member, distinguished—

The CHAIRMAN. Help me out. Say your last name.

Mr. ANGELLE. Sure. Angelle.

The CHAIRMAN. Thank you.

Mr. ANGELLE. Mr. Chairman, Mr. Ranking Member, and distinguished members of the Senate Energy and Natural Resources Committee, I would like to thank you for the invitation to come here before you. I congratulate all of you on providing the leadership style on America's energy issues. And on behalf of the great State of Louisiana, a special thanks to Senator Landrieu.

I hope that my comments will aid you in making the important decisions that you are considering in this Congress to shape the future of our Nation's energy supply. It is imperative that we, as a Nation, stop reacting to energy situations imposed on us by outside forces, and instead proactively start shaping our own energy future.

One of the ways to do that is to develop the full potential of the Nation's offshore energy resources and to assist those States that make that production possible off their coasts by sharing some of the offshore revenues. This would encourage those States to pursue more development. And it would help offset infrastructure costs those States incur that is associated with that development.

Louisiana has a long and distinguished history of oil and gas production, providing much of America's energy supply. Currently, 34 percent of the Nation's natural gas supply and almost 30 percent of the Nation's crude oil supply is either produced offshore in Louisiana or moves through the State and its coastal wetlands. To-

gether with the infrastructure in the rest of the State, this production is connected to nearly one half of the total refining capacity in the United States.

It is our State's desire to not only continue this production, but to seek additional ways to increase it and to continue to ensure that this supply is provided to the rest of the Nation. You see, we in Louisiana understand just how vital these energy resources are to the Nation's economy. At the same time, Louisiana can look at experience and footnote that offshore development and associated onshore infrastructure construction and operations can be done in an environmentally responsible way today.

Louisiana, like other coastal producing States sustains impacts on coastal communities and bears the cost of onshore infrastructure to support this production activity. In my State, pipelines, canals, and other infrastructure features exacerbate the loss of more than 24 square miles of our coastal land each year, believed to be the fastest rate of land loss anywhere on the planet.

In fact, Mr. Chairman, you have heard me say before that if what is happening today in coastal Louisiana were happening in our Nation's capital, the Potomac River would be washing away the steps of this building today, the White House next year, and the Pentagon soon thereafter. During the course of this morning alone, Louisiana will lose a football-field-wide area from the Capitol Building to the Washington Monument.

When States like yours, Mr. Chairman, force drilling on Federal lands onshore, they receive 50 percent of those revenues in direct payments and consequently have the financial resources to support that infrastructure. In fiscal year 2004, Wyoming and New Mexico together received about \$928 million from those revenues, which we believe it is an appropriate revenue-sharing procedure.

In contrast, for example in 2001, of the \$7.5 billion in revenues generated in the Federal Outer Continental Shelf area, only a fraction of 1 percent came back to those States. This inequity is truly profound.

Does it not make sense to encourage the coastal producing States which provide that revenue for the benefit of the rest of the Nation, does it not make sense that when so many, like the U.S. Ocean Commission, are targeting offshore OCS revenues to pay for worthwhile preservation of natural resources, that this Nation first protect those who make these resources possible?

While we are all interested in new sources of energy, might I suggest that we make sure to protect our current sources? In this case, a bird in the hand is better than two in the bush.

Stepping up to the plate to help the Nation obtain new supplies of energy including LNG, Louisiana is home of one of the four country's existing LNG import terminals built some 20-plus years ago. And when high energy prices and Alan Greenspan's comments caused an increase in the siting of LNG facilities, Louisiana answered the call for America once again. The world's newest LNG permitted facility, which is also now the continent's largest permitted facility, accomplished in a record-setting permit application time of 364 days, is in Louisiana, all because the Federal Energy Regulatory Commission and the State of Louisiana did it right.

But again, our Governor has said time and time again: While we remain open to LNG activity, we will not forsake protecting our land, air, water, and public safety. We just seem to understand perhaps more than other States our need to help America in these critical times. But it also is important to understand that there is no free lunch. And we are now in here to get help to save coastal Louisiana.

To help bring the point of infrastructure vulnerability, we need only look at this past summer and the effects of Hurricane Ivan. While the storm made landfall some two States away, much of the damage occurred along pipeline routes. It made a significant impact on oil and gas production. I shudder to think of the environmental damage and economic impacts to this Nation had Ivan gone a relatively few miles further west with a direct hit on the infrastructure off Louisiana's shore.

According to analysts, oil prices would realistically be at \$75 a barrel. In fact, some of our production in Louisiana is still shut-in from the effects of that storm some 7 months after making landfall.

In conclusion, it is vital to the Nation's security and prosperity that new energy sources be developed. The Federal Government has proven that it has the ability to steer investment, as in the case of deep water drilling in the Gulf and coal seam gas.

Section 29 of the Internal Revenue Service Code granted tax relief, a tax credit for the production of natural gas from unconventional resources. The effect of the application for coal bed methane gas production was astounding. The section 29 credits need to be instituted for State borders and onshore areas, at least in those States allowing Federal offshore production.

The CHAIRMAN. We are just about to run out of time. I want to tell you, hold you to your agreement to come back and holds us to ours. We will be here at 2 o'clock. We will take your testimony and ask some questions. You use your own judgment.

We may or may not have questions, but if you want to be there in case we do—thank you. We will recess temporarily.

[Recess.]

Senator LANDRIEU [presiding]. We will go ahead and, at the chairman's instructions, proceed to continue the hearing. I know that Senator Domenici is on his way. And I am trusting that some of the other members will be joining us shortly.

But I thank you all for your patience and for being flexible because of the schedule and the votes that occurred right before we were going to break for lunch.

But I think, Mr. Angelle, you were in the middle of wonderful, inspiring, and encouraging testimony. So would you continue? And then we will hear from Senator Frank Wagner and also our noble Energy Director.

Mr. ANGELLE. Thank you, Senator.

I would just wrap up very briefly by saying: With effective policies and incentives, the Federal Government can steer investment into the offshore areas. And by receiving an equitable share of revenue generated offshore, the coastal-producing States can be in a position to ensure that this production will be made available to the rest of the Nation.

As the granddaddy of all producing States, Louisiana desperately needs immediate revenue-sharing financial assistance from a source that is not subject to annual appropriations, to continue to maintain existing and to develop future energy supplies for the nation. It would be a travesty for the Congress to enact national energy legislation without substantial OCS revenue sharing in the form of direct payments to the coastal-producing States from the revenue derived from offshore productions similar to the automatic payments for drilling on Federal lands onshore and before any other disbursement of those moneys.

Thank you.

Senator LANDRIEU. Thank you, Mr. Angelle.

[The prepared statement of Mr. Angelle follows:]

PREPARED STATEMENT OF SCOTT A. ANGELLE, SECRETARY,
LOUISIANA DEPARTMENT OF NATURAL RESOURCES

Mr. Chairman, Mr. Ranking Member, and distinguished members of Senate Energy and Natural Resources Committee, I would like to thank you for your invitation to come before your Committee today. I hope that my comments will aid you in making the important decisions that you are considering in this Congress to shape the future of our nation's energy supply. It is imperative that we, as a nation, stop reacting to energy situations imposed on us by outside forces, and instead, proactively start shaping our energy future. One of the ways to do that is to develop the full potential of the nation's offshore energy resources and to assist those states that make that production possible off their coasts. This can be accomplished by sharing with those coastal producing states some of the offshore revenues generated off their coasts. This would encourage those states to pursue more development, and it would help offset infrastructure costs those states incur that is associated with that development.

LOUISIANA'S ROLE AS A PRODUCING AND CONSUMING STATE

Energy is the lifeblood of an industrialized nation and a key economic driver for the country. A reliable and affordable supply of energy is necessary for economic development, prosperity, and expansion. Although technological improvements and investments in energy efficiency have reduced this country's energy consumption per unit of Gross Domestic Product over the past 20 years, increased economic prosperity is still dependent on increased energy consumption. In the U.S., the availability of energy has generally been taken for granted, but recent blackouts in California and other parts of the country, the emergence of 50 plus dollar per barrel oil and \$7 to \$8 per million BTU natural gas, and the drive to build terminals to import foreign natural gas in the form of a cryogenic liquid, have highlighted the need for addressing energy supply.

I come to you representing a state to which energy is its middle name. The words Louisiana and energy are almost synonymous. Among the 50 states, Louisiana ranks (2003 Energy Information Administration—EIA data):

- 1st in crude oil production
- 2nd in natural gas production
- 2nd in total energy production from all sources

The importance of energy to Louisiana is further highlighted in the following rankings in which Louisiana is (2002 EIA data latest available):

- 2nd in petroleum refining capacity
- 2nd in primary petrochemical production
- 3rd in industrial energy consumption
- 3rd in natural gas consumption
- 5th in petroleum consumption
- 7th in total energy consumption
- but, only 22nd in residential energy consumption

Usually, when national energy issues are discussed, Louisiana is cast in the image of a rich producing state floating in a sea of oil and gas that is being inequitably shared with the consuming states. Often misunderstood or overlooked, is the fact that about two thirds of the production from the state is in the Louisiana federal OCS territory and, hence, produces no revenue for the state, while at the same

time incurring significant infrastructure support costs to the state, which I will discuss in more detail later.

Also often overlooked or not explained, is the fact that, though Louisiana is the 2nd highest energy producing state in the nation, Louisiana is also 7th highest in total energy consumption. Therefore, Louisiana is more of a consuming state than 43 other states! This story is never told, nor are Louisiana's difficulties as a key consuming state given much concern at the federal energy policy level. Thus, when Louisiana, the energy producing state speaks, it is also Louisiana, the energy consuming state speaking. Louisiana is inexorably tied into the issues of all states in the nation, whether considered producing states or consuming states. However goes the energy situation in Louisiana, so goes the energy situation in the United States of America.

SUPPLYING THE NATION: LOUISIANA—AMERICA'S ENERGY CORRIDOR

Louisiana has a long and distinguished history of oil and gas production, providing much of America's energy supply. Currently, nearly 34% of the nation's natural gas supply and almost 30% of the nation's crude oil supply is either produced in Louisiana, produced offshore of Louisiana, or moves through the state and its coastal wetlands. Together with the infrastructure in the rest of the state, this production is connected to nearly 50% of the total refining capacity in the United States.

When it comes to developing the nation's offshore energy resources, there would not be much if it were not for Louisiana's leadership and participation. The OCS territory offshore Louisiana is the most extensively developed and matured OCS territory in the world. According to preliminary 2004 data, the Louisiana OCS presently produces approximately 91% of oil and 75% of natural gas production in the OCS. Louisiana OCS territory has produced 88.7% of the 15.5 billion barrels of crude oil and condensate and 83.2% of the 154 trillion cubic feet of natural gas ever extracted from all federal OCS territories from the beginning of time through the end of 2004.

Stepping up to the plate to help the nation obtain new supplies of energy including liquefied natural gas (LNG), Louisiana is the home of the largest throughput facility (Southern Union in Lake Charles) of the four existing LNG import terminals in the U.S., and it is undergoing more than a doubling of capacity from 1 billion cubic feet per day to 2.5 billion cubic feet per day. While almost every state in the nation is trying to prevent the siting of any new LNG facilities, Louisiana is the site of the newest permitted LNG terminal (Shell's 1 billion cubic feet per day Gulf Landing facility offshore Louisiana) and of the largest permitted LNG import terminal in the nation (Cheniere Energy's 2.6 billion cubic feet per day facility in Sabine Parish).

The vehement opposition to LNG facilities almost everywhere but in Louisiana and Texas is causing developers to get creative. Such is the case with the offshore Energy Bridge LNG gasification terminal promoted by El Paso Energy and sold to private interests. It is simply a seabuooy attached to a pipeline header to shore. The gasification facility equipment is all located onboard specially constructed LNG tankers using an open seawater system as the heat source for regasification of the LNG. Three such tankers are on order. The first is already operational and has just made its first delivery to the U.S. Although this onboard ship system avoids much of the controversy of siting a permanent LNG terminal, it also liberates the ship from having to unload its cargo at an expensive fixed terminal, enabling it to easily deliver its cargo of LNG to any place in the world that it can merely hook up into a receiving pipeline. This lack of a physical dependence on a limited number of expensive receiving terminals is good for the supplier, but not necessarily for the purchaser, who in the future could be outbid by another purchaser virtually anywhere in the world, which might just not be a seabuooy in the U.S.

Louisiana is also the home LOOP (Louisiana Offshore Oil Port), the only deep-water offshore oil import terminal in the world.

All of this represents only the direct supply line of oil and natural gas. Additionally, Louisiana's 7th highest ranking among the states in energy consumption is attributable to the fact that Louisiana is consuming most of this energy as a through-processor of energy supplies for the rest of the nation, consuming colossal amounts of energy for their benefit. An example of how Louisiana is consuming energy resources for the primary benefit of other states is petroleum refining. The energy equivalent of 10% of Louisiana's entire petroleum product consumption is required just to fuel the processes that refine crude oil into gasoline, diesel fuel, jet fuel, heating oil and other products consumed out of state. The oil refining industry employs only about 10,400 workers in the state; whereas tens of millions of jobs throughout

the country are dependent on the affordability and availability of the products from the continued operation of these refineries and associated petrochemical facilities in Louisiana.

Many other examples could be cited of the numerous energy intensive natural gas and oil derived chemical products Louisiana (and also Texas, Oklahoma, and California) through-processes for the rest of the U.S. Per unit of output, these industrial processes in Louisiana are characterized as capital (equipment), energy, raw material, and pollution discharge intensive, and low in labor requirements and dollar value added, essentially the opposite of the downstream industries in other states that upgrade these chemicals into ultimate end products. Much of the energy Louisiana technically consumes is really the transformation of oil and gas into primary chemical building blocks that are shipped to other states where the final products are made, whether it be plastic toys, pharmaceuticals, automobile dash boards, bumpers and upholstery, electronic components and cabinets, synthetic fibers, or thousands of other products dependent on this flow of energy and high energy content materials out of Louisiana.

Governor Blanco has asked me to convey to you today the State's desire to not only continue this production, but to seek additional ways to increase it and to continue to insure that this supply is provided to the rest of the nation and to ask for your help in doing so. You see, we in Louisiana understand just how vital these energy resources are to the nation's economy.

OCS INFRASTRUCTURE AND ITS IMPACTS AND NEEDS

It is important to understand that there is no free lunch. Louisiana, like other coastal producing states, sustains impacts on coastal communities and bears the costs of onshore infrastructure required to support this production activity. In Louisiana, pipelines, canals, and other infrastructure features contribute to the loss of more than 24 square miles of our coastal land each year. In fact, and Mr. Chairman, you have heard me say before, that if what is happening today in coastal Louisiana were happening in our nation's capital, the Potomac River would be washing away the steps of this building today, the White House next year, and the Pentagon soon after that. In fact, during the course of this morning alone, Louisiana will lose a football field wide area from the Capitol Building to the Washington Monument.

There are many causes of this coastal erosion in Louisiana, including what may be the most significant factor: building levees and channeling the Mississippi River. Whatever the cause of its demise, the health and restoration of Louisiana's coastal wetlands are vital to protecting the offshore and onshore infrastructure that is essential for the continuation, as well as the expansion, of offshore energy production in the Gulf of Mexico.

Obsolete Practices of the Past Cause Louisiana's Problems Today

This raises one issue I would like to address. If offshore exploration and production causes or adds to coastal erosion and other environmental harm, why would any state want to support it? Simply stated, Louisiana's environmental damage issues pertaining to petroleum drilling and production are primarily related to two issues:

- (1) Forces of nature that have nothing to do with the petroleum industry, but which threaten its existence, and
- (2) Impacts from legacies of obsolete practices of the past continuing to cause problems in Louisiana's ultra-fragile mostly marsh coastline.

Louisiana's first well was drilled in 1868. The first oil well over water in the world was in Louisiana in 1910 in Caddo Lake. The first well drilled offshore Louisiana was in 1933 near Creole, Louisiana. Louisiana was the site of the first well drilled out of sight of land in 1947.

Things have changed dramatically since 1910, 1933, 1947, or even 1960, 1970, or 1980. Offshore drilling was pioneered in Louisiana, long before modern sensitivity to the environment, advanced technology and environmental regulations. Simply put, it was like the old Wild West out there. Once, hardly anybody gave a second thought to the oil companies slicing and dicing the coastline to build canals and pipelines or to discharging produced water and drilling fluids overboard; it was all considered a sign of progress.

Everything is different now. That world and those practices have nothing more in common with modern exploration and production techniques than Conestoga wagons crossing the Oregon Trail in the 1800's have in common with jet airliners flying overhead today. Offshore development and the associated onshore infrastructure construction and operation are done in an environmentally responsible way today and under the oversight of several State and federal regulatory agencies.

Once the State realized magnitude of the coastal erosion problem, we got serious about doing something about it. In 1980, the coastal restoration permitting program was moved to the Department of Natural Resources (DNR). In 1981, \$40 million of state oil and gas revenue was set aside in a legislative trust fund for coastal restoration projects. The State has a dedicated revenue stream of up to \$25 million per year, depending on the level of revenue collections from oil and gas production within the state, to replenish the fund. In the past few years, that replenishment stream has been at the \$25 million level. In 1989, the Office of Coastal Restoration and Management was created in DNR, and the magnitude of the program was greatly expanded.

Extent of Louisiana Infrastructure Supporting OCS Production

The total value of the Louisiana OCS infrastructure and the onshore infrastructure supporting it is difficult to ascertain. The estimated depreciated investment in offshore production facilities is over \$85 billion, depreciated offshore pipeline infrastructure is over \$10 billion, and public coastal port facilities is \$2 billion, for a total of approximately \$100 billion, depreciated, and not counting highways, sewer, water, fire and police protection, schools, and other public works structures that also have ongoing operation and maintenance costs. The replacement of all of this would be several times the \$100 depreciated figure. It also does not count the onshore coastal infrastructure of pipelines, storage facilities, pumping stations, processing facilities, etc.

This infrastructure is vulnerable if not protected by the State's barrier islands and marshes. As these erode and disappear, infrastructure is exposed to the open sea and all of its fury. As the coast recedes, near shore facilities become further offshore and subject to greater forces of nature, including subsidence, currents, and mudslides. Erosion in the coastal zone is already beginning to expose pipelines that were once buried.

A Wake-up Call from Hurricane Ivan

To bring home the point of infrastructure vulnerability, we need only look back to this past Summer. Hurricane Ivan was not even a direct hit on Louisiana's offshore and coastal oil and gas infrastructure, striking two states away; yet, its effects on the nation's supply of oil and gas were significant, even many months after it hit. Most of the damage occurred along pipeline routes rather than actual structural damage to the producing platforms. As of February 14, 2005, when the Minerals Management Service (MMS) released its final impact report on Ivan, 7.42% of daily oil production and 1.19% of daily gas production in the Gulf of Mexico was still shut-in. The cumulative shut-in production through February 14 was 43.8 million barrels or 7.25% of annual Gulf of Mexico OCS production and 172.3 billion cubic feet of natural gas or 3.9% of annual Gulf of Mexico OCS gas production.

As more of the protection from Louisiana's barrier islands and coastal wetlands wash away, increasingly more of this offshore production will be damaged or destroyed by even less powerful storms than Ivan, and particularly by storms whose paths more directly pass through the producing areas off of Louisiana's coast. Direct hits to the prime production area by hurricanes and tropical storms will cause incalculable damage to this production infrastructure, as well as to the onshore support infrastructure.

HOW TO INCREASE OFFSHORE ENERGY PRODUCTION

Share Offshore Revenue with the States that Allow Offshore Production

When states like yours, Mr. Chairman, host drilling on Federal lands onshore, they receive 50% of those revenues in direct payments, and consequently have the financial resources to support that infrastructure. In Fiscal Year 2004, Wyoming and New Mexico together received about \$928 million from those revenues, which is an appropriate revenue sharing procedure.

In contrast, for example in 2001, of the \$7.5 billion in revenues produced in the federal outer continental shelf area, only a fraction of one percent came back to those states. The inequity is truly profound.

We are pleased this committee is investigating ways to increase offshore energy supply. The need to sustain the existing supply that Louisiana provides must simultaneously be addressed. The most effective answer to both issues is share offshore revenues with the coastal producing states that make that production possible. It is critical that coastal producing states receive a fair share of revenues to build and maintain onshore infrastructure and, in Louisiana's case, to help stem our dramatic land loss, which is occurring at a rate believed to be the fastest on the planet.

Production off Louisiana's shores alone contributes an average of \$5 billion a year to the Federal treasury, its second largest source of revenue.

Does it not make sense to encourage the coastal producing states which provide that revenue for the benefit of the rest of the nation? Does it not make sense, that when so many, like the U.S. Ocean Commission, are targeting offshore OCS revenues to pay for worthwhile preservation of natural resources, that this nation first protect those who make these resources possible?

Already, in Louisiana's coastal zone, many of the pipelines and other infrastructure that our wetlands have historically protected are now exposed to open Gulf of Mexico conditions.

I shudder to think of the environmental damage and the economic impacts to this nation, had Ivan gone a relatively few miles further west with a direct hit on the infrastructure off Louisiana's shore. According to analysts, oil prices would realistically have hit \$75 dollars a barrel.

Maintaining any ongoing operation requires reinvestment to maintain, repair, and replace worn out or outdated equipment and facilities. As any farmer can tell you, you cannot just take from the land forever without putting something back into the operation. Out of the harvest of crops, the farmer has to set aside a portion as seed to plant for the next harvest. He has to fertilize the land to replace depleted nutrients, plow and till the soil, rotate crops, control runoff and erosion, irrigate, apply pesticides and herbicides, buy and repair machinery. Likewise, to maintain, much less increase, production from off our coasts, we must reinvest in the infrastructure that makes all of the activity possible, whether it be port facilities, roads to transport equipment and supplies, erosion control, or barrier island and wetlands storm protection.

Extend Section 29 Tax Credits to Deep and Ultra-Deep Production in States Allowing Offshore Production

Section 29 of the Internal Revenue Service (IRS) Code granted a tax credit for the production of natural gas from unconventional resources (coal bed methane and tight sands gas). The effect of the application to coal bed methane gas production was astounding in those areas of the country that have significant deposits of this kind, which is not along the Gulf Coast. Natural gas reserves from coal bed methane rose from 6.3% of U. S. reserves at the end of 1993 to 9.9% at the end of 2003. Annual natural gas production from coal bed methane rose from 4.2% of U. S. dry gas production in 1993 to 8.2% by the end of 2003.

Deep natural gas reserves (15,000-24,999 feet sub-surface) and ultra-deep gas reserves (greater than 25,000 feet sub-surface) are the next most immediate resources for meeting the supply and deliverability needs of the U. S. market. These resources should be granted the same tax credit as was granted to coal bed methane producers. The resulting stimulus to production should be at least equal to the coal bed methane results, and would very likely far exceed it in time as capital is brought to bear on this drilling domain. The MMS has recently instituted significant deep shelf royalty incentives for the shallow federal waters of the Gulf of Mexico shelf. This does no good for the adjacent state waters and onshore areas. The Section 29 credits need to be instituted for state waters and onshore areas, at least in those states allowing federal offshore production.

Encourage New Energy Sources and Technology

Recent studies show that the Gulf of Mexico has a significant wind energy potential. Although wind power does not have the energy density of petroleum, it is an inexhaustible, renewable source of clean energy. Again, much to my consternation, it appears that there are many parts of the country that use a lot of energy and want it low prices, but do not want the production of any kind, anywhere near them, including wind energy. Again, Louisiana is stepping up to help encourage this clean energy source. The State of Louisiana is currently working with private sector investors who are interested in developing wind farms in state and federal waters off Louisiana's coasts. My office is submitting wind power legislation before the Louisiana Legislature in the session starting later this month, to facilitate offshore wind power development in Louisiana's State offshore waters.

Natural gas hydrates probably offer the greatest untapped energy resource the nation has. *The Oil and Gas Journal* recently reported that the U.S. Geological Survey estimates that methane hydrate deposits are greater than all other forms of fossil fuels combined. Large deposits of gas hydrates are believed to lie below the offshore waters of the U.S. Unfortunately, technology to tap these resources needs to be developed. Once the technology is available, the first areas to be developed will be the areas adjacent to the existing offshore producing areas where the infrastructure is in place to get it to shore and into the nation's pipeline distribution system. The federal government needs to fund meaningful research into developing the technology to produce gas hydrates, assessing the resource base, and producing it.

IN CONCLUSION

It is vital to the nation's security and prosperity that new energy sources be developed. The federal government has proven that it has the ability to steer investment, as in the case of deep water drilling in the Gulf and coal seam gas. In addition to its significance in producing 30% of oil and 23% of natural gas produced domestically, which is mostly off Louisiana, the OCS is probably the single most promising area for the U.S. to obtain significant new energy supplies. These supplies, whether conventional oil and gas, imported oil, imported LNG, wind and ocean energy, or gas hydrates, need the support of coastal states to cooperate and to supply and maintain critical production and support infrastructure.

LNG facilities are being built where the existing U.S. pipeline infrastructure exists (essentially Louisiana and Texas) in order to get the gas from the coast into the delivery system to supply the nation. The same will be true when the technology is developed to commercialize methane hydrate production off the coasts. This Louisiana and Texas infrastructure will also be used when deep and ultra-deep shelf production comes on stream. This is another reason why offshore revenue should be shared with the coastal producing states and why the extension of Section 29 tax credits should be extended to deep gas exploration at least in the states that are allowing onshore and offshore drilling and allowing the siting of LNG facilities to make energy available to the rest of the country.

With effective policies and incentives, the federal government can steer investment into the offshore areas, and by receiving an equitable share of revenue generated offshore, the coastal producing states can be in a position to ensure that this production will be made available to the rest of the nation. As the granddaddy of all producing states, literally and figuratively, Louisiana desperately needs immediate revenue sharing financial assistance from a source not subject to annual appropriations, to continue to maintain existing, and to develop future energy supplies for the nation. Governor Blanco is submitting legislation for a State constitutional amendment to dedicate to coastal projects, any future new OCS revenue the State may receive, to show Louisiana's commitment to use money the federal government shares with the State to put into coastal restoration to rebuild and protect the OCS production infrastructure.

It would be a travesty for the Congress to enact national energy legislation without substantial OCS revenue sharing in the form of direct payments to the coastal producing states from the revenue derived from offshore production, similar to the automatic payments for drilling on federal lands onshore, and before any other dispersal of those monies.

Thank you for this opportunity to appear before you.

Senator LANDRIEU. Senator Wagner.

**STATEMENT OF FRANK W. WAGNER, SENATOR, 7TH DISTRICT,
STATE OF VIRGINIA**

Mr. WAGNER. Thank you, Madame Chairwoman.

During the 2005 session of the Virginia General Assembly, I introduced Senate bill 1054, which, after amendment, requested the Virginia Liaison Office to lobby in Washington, to lobby Congress on behalf of Virginia to lift the moratorium for development of natural gas off the Atlantic Seaboard with a shared royalty plan with States and coastal localities similar to that proposed in the SEACOR legislation.

Madame Chairwoman, this is a win-win-win situation, as I see it. The Federal Government wins because it is going to derive royalty payments currently not available to them. The States and local jurisdictions win because they will receive a new stream of revenue that is currently not available to them. However, the biggest winners are the American people, those Americans who are struggling to pay their energy bills, those whose jobs rely on reasonably priced, reliable sources of natural gas, those American farmers whose very livelihood depends on access to reasonably priced fertilizers, and those Americans who will be employed harnessing our own domestic energy.

Madame Chairwoman, the inclusion of a conservative estimate of 30 trillion cubic feet of natural gas off the Atlantic Seaboard will not solve our nation's energy problems, but it is one brick in a wall that we must build.

I was also surprised to learn that the moratorium on offshore drilling in the Atlantic Basin has already been lifted, not by the United States, but by our friends to the north, Canada. Canada is presently recovering over 500 million cubic feet of natural gas per day off of Nova Scotia. This supply of gas provides much of eastern Canada's natural gas needs, as well as the gas that is currently exported to the Northeastern United States.

The fact that this offshore operations are adjacent to the Grand Banks, arguably one of the most important fishing grounds in the world, is a testament to the innovations and engineering and technology that have made offshore drilling a safe, cost-effective, and reliable method of recovering natural gas.

Senate bill 1054 was an outgrowth of the joint legislative study on the needs of the future of manufacturing in Virginia. Virginia has lost 70,000 manufacturing jobs in the past decade, many attributable to threefold increase in the price of natural gas over the past 5 years. A reliable and reasonably priced source of natural gas is vital to Virginia's pulp and paper industry, chemical and fertilizer industries, and those manufacturers who rely on heat treating as part of the manufacturing process. Every new electric generation plant built in Virginia over the past 10 years burns natural gas due to air permitting requirements.

And then there are constituents, the families in my district or your State who are working hard to pay their bills and are now faced with soaring prices at the gas pump along with skyrocketing utility bills.

Senate bill 1054 passed the General Assembly in a bipartisan manner. And while the Governor vetoed the bill, in his veto explanation he cited only two reasons. He felt it was not within the purview of the General Assembly to direct the Virginia Liaison Office. And second, he did not feel it was appropriate to begin lobbying efforts before a formal bill had been introduced in Congress.

And, Madame Chairwoman, I can tell you I sat down at length with the Governor. And I told him that I felt we probably ought to get on board, because I felt this year Congress was going to move if not on an energy bill, certainly a natural gas bill. And I believe us being up here today probably says I was more correct than I thought I was.

The Governor also directed that a study be conducted on offshore operations and has indicated to me that he has a very decidedly open mind on the issue. I am quite certain that when his study is complete, the Governor will come to the same conclusion that many of us already have, that given the technological advances over the past 20 years, that offshore development of our natural gas reserves is altogether appropriate and the moratorium should be lifted.

Virginia's General Assembly has spoken. We want to develop our offshore resources, and we would like to share in any royalty payments that are made. I would also like to add that since the Virginia General Assembly's passage of Senate bill 1054, the positive

responses I have gotten from my constituents have far outweighed the few negative letters on the issue.

I thought I might have gone out on a political limb by pushing this legislation. However, I find I have climbed an oak tree as solid as any in Virginia. I can only conclude that Virginians recognize there is something fundamentally wrong with our energy policy. They understand that our foreign policy, our trade deficit and inflation concerns are, to a certain degree, driven by our need for foreign energy.

They also are reminded constantly at the gas pump and when they open their utility bills that there is a growing problem.

To the maximum extent possible, they want domestic solutions to our energy problems, solutions that employ Americans, using American technology to provide energy for American use.

Madame Chairwoman, I believe Virginia has spoken. We in Virginia and indeed the entire nation look to your committee to provide us the legislative framework to move America toward a sound and progressive national energy policy.

Thank you.

Senator LANDRIEU. Thank you, Senator, for your good work.

Mr. Davidson.

**STATEMENT OF CHARLES DAVIDSON, CHAIRMAN, PRESIDENT
AND CEO, NOBLE ENERGY, INC.**

Mr. DAVIDSON. Thank you, Madame Chairwoman. I truly appreciate the opportunity to be here today. My comments are going to focus on technology and some of the questions that we heard earlier today in terms of what is evolved in terms of technology and our industry. And I will be making a few brief comments that basically supplement the written testimony that was provided earlier.

I am Charles Davidson, chairman, president, and CEO of Noble Energy, a leading independent here in the United States. I am also vice chairman of the Domestic Petroleum Council. I also chair the Offshore Committee of the IPAA. And my comments today are on behalf of both of those organizations. And also supporting our testimony is the International Association of Drilling Contractors, the International Association of Geophysical Contractors, the National Ocean Industries Association, and U.S. Oil and Gas. So I had lots of help, and some say I need it.

But anyway, in looking at technology, it has had truly an amazing impact on our industry. And it is a real shame that we have lost sight of the fact that when we first began putting coastal waters into moratoria in the early 1980's, a lot of that technology was not available then. And we have lost sight of how it has evolved since then.

So what I want to do is talk a bit about our exploration technologies, our drilling technologies, and some of the things that are allowing us to develop further offshore with greater and much reduced impact on the environment as we go forward. So if you will permit, I am going to show a few slides, as I think really pictures are worth a thousand words here.

This is focuses more on exploration. And it just shows that with new technology, in terms of seismic and visualization techniques, our explorationists can now look and see much more clearly the

reservoirs and targets they are going for. The impact is that we have greater success with our drilling. It takes fewer wells to develop these fields.

So I will move this forward a little bit.

You can see this is a visualization. We are looking down on top of the well right now. That colored surface down there is actually salt. This particular field was drilled through salt in the Gulf of Mexico with the field actually below it. And so as we let it roll further, we suddenly see the visualization of the field, which was again done by using seismic imaging along with a great computing technology we have. And they would say even sometimes a CEO could pick out a few locations there.

But what it is doing is it is showing the seismic is actually in the background. The red represents hydrocarbon-bearing strata; the blue, water-bearing. And as you can see, you can optimize your well location, find out perhaps where there are some new locations. Again, it allows the industry to better develop fields, fewer wells, more successful wells, as we go forward.

Other areas that we have looked at in terms of advanced drilling technologies—and again, I will just add a couple of points to what is in the written testimony—you can see some of the benefits here, as we are able to reach multiple targets with fewer well bores, better environmental capabilities.

The advanced drilling technology is just truly amazing. A question was asked this morning about how does it compare offshore with some of the other areas we have seen, say in Alaska. And I think Director Burton answered it very well. But they are truly amazing. And the things that we are doing, directional drilling offshore, where we link multiple reservoirs that may not be aligned with a single well, or we use horizontal drilling that puts a well bore through a large portion of the reservoir, extended reach, where we can go out very long distances away from a platform to get to remove reservoirs, or multilateral drilling, where we actually take a well bore and split it so that we can go two opposites directions to develop reservoirs.

Subsea tiebacks. This is a technology that has truly evolved and, as you know, has been a major development offshore Louisiana in some of the deep water areas. This is an example my company is involved in. It is 5,000 feet of water, basically a mile deep. There was a smaller prospect, called Ticonderoga that you can see there. It could not justify its own surface penetrating facility, but we put the well heads on the floor, we flow it back to an existing spire. Actually, this one is being built right now. And so as a result, we are able to recover additional resources that would not have been recovered before.

The amazing thing about these is that it is growing very rapidly. This just shows in the Gulf of Mexico how subsea well completions are evolving. But when you look at this technology throughout the world, there is many other places in the North Sea and others where it has gone even more rapidly.

But I think the key is resources. And again, this is a point that was raised this morning. Early on, our resource estimates tend to be low. And you can see here in 1974, the Gulf of Mexico's gas resources were estimated to be 50 trillion cubic feet. Since then, we

have produced 160 trillion cubic feet, and the estimate is there is another 232 trillion cubic feet left. Clearly, a tremendous growth in the resources.

And again, it is interesting to note that that 1974 Gulf of Mexico resource estimate of 50 trillion cubic feet is about now what is estimated for the Atlantic and Pacific areas. Although, as was noted earlier, there is very limited data.

So again, it is a real pleasure to be here. I think that in just a few minutes it is hard to describe all the technology our industry has developed over the past few years, but it has clearly enabled us to do so much more than we were ever capable of doing 15 years ago.

Thank you. It is a pleasure.

Senator LANDRIEU. Thank you, Mr. Davidson.

[The prepared statement of Mr. Davidson follows:]

PREPARED STATEMENT OF CHARLES DAVIDSON, CHAIRMAN, PRESIDENT AND CEO,
NOBLE ENERGY, INC.

Thank you, Mr. Chairman, for the opportunity to be here today to be part of an increasingly important national energy policy discussion.

I am Charles Davidson, Chairman, President and Chief Executive Officer of Noble Energy, Incorporated, one of the largest independent natural gas and oil exploration and production companies in the United States.

I am also vice chairman of the Domestic Petroleum Council that represents the largest US independents, and I chair the Offshore Committee of the Independent Petroleum Association of America (IPAA) that represents thousands more independents of all sizes. I am providing comments today on behalf of both organizations.

Members of the DPC alone have approximately 4,500 Gulf of Mexico lease interests, including operator designations on some 2,900 leases, 400 in ultradeepwater (1,600 meters or deeper). With the other IPAA members who are active offshore, you can see that independents are truly leaders in providing natural gas and oil from the US waters that are open to exploration and production. And we are leaders around the world.

The sad fact, however, is that only some ten percent of US waters outside of Alaska are available for us to apply the best energy technology in the world.

Put another way, the United States is the only developed country in the world with our type of "blanket moratoria" areas that have prevented even the consideration of energy development for decades.

When we began placing coastal areas off limits to energy development in 1981, many of the technologies we use today were not available—and perhaps not even imagined. Today we have an important opportunity to focus on the future—and different policies that may allow careful consideration of offshore energy activity in selected areas—building on exciting technology improvements.

Today I want to build on that point, and in doing so answer a number of questions about the 21st Century technology that

- increases our ability to find resources;
- decreases the number of wells needed in both exploration and development of those resources;
- decreases the need for surface facilities;
- decreases the visibility of our operations; and,
- does all this in ways that are very compatible with the environment. In the few minutes I have, I would like to touch on each of these topics.

First, geoscience improvements, including use of 3-D seismic and visualization technologies.*

These may also involve the most sophisticated use of supercomputer analyses to allow us to better "see" and understand geology and potential resource deposits deep underground. These improvements allow better success in finding natural gas and oil, more accurate targeting of wells—meaning fewer, more successful ones—and less capital investment risk.

* All illustrations have been retained in committee files.

Drilling technology continues to rapidly advance resulting in many benefits, including fewer surface penetrating facilities such as platforms and the ability to develop distant reservoirs.

Specific examples include directional drilling that allows development of reservoir or several reservoirs not directly beneath a platform. Other examples are shown in the graphic.

There has also been rapid growth in the number of "subsea" well completions—placing wellheads and other facilities on the ocean floor rather than on the surface.

These subsea completions include both shallow water and deepwater production facilities that utilize the latest technology. One benefit is to reduce the visibility of offshore platforms.

One of the best tools for offshore producers in the Gulf of Mexico is the utilization of subsea tiebacks to central manifolds. These tiebacks, some of which cover over 20-30 miles, allow producers to produce natural gas and oil over great distances from a single production platform. The graphic of the Ticonderoga project, in 5,000 feet of water, provides an excellent example of subsea technology put to use.

The U.S. and worldwide increase in subsea projects has been dramatic. This technology can allow many wells to be produced from fewer facilities, perhaps well over the horizon. In addition, subsea developments enable smaller reservoirs to be developed that were not justified in the past.

Which brings us to estimates of resources in areas under moratoria.

As you see here, our estimates of U.S. offshore resources have grown substantially over time in areas that have been open to exploration.

In essence, the more we explore, the better we are able to estimate resources.

Look at the 1974 Gulf of Mexico natural gas resource estimate of some 50 trillion cubic feet. Compare that to today's estimate of 232 trillion cubic feet—on top of the 160 trillion cubic feet that has already been produced from the Gulf of Mexico. We have produced three times what we thought existed in 1974—and we now estimate almost five times more remaining. The more we explore, the more we know.

(It is interesting to note that the current natural gas resource estimates for the Atlantic and Pacific add up to about what we thought was in the Gulf of Mexico in 1974.)

In conclusion, we are very pleased to see serious discussion of how we as a nation might approach making decisions as to whether to open some additional offshore areas to help meet the energy needs of consumers. We are convinced that the technology used around the world today in the search for, and production of, natural gas and oil will provide a solid underpinning for sensible policies that move in that direction.

Thank you.

I'll be glad to answer questions.

Senator LANDRIEU. I do have a couple of questions, and I would like to start on this technology question. Because some of the members, I think, are particularly interested in this and the extraordinary advancements of technology.

I want to just be sure for the record that we got the final slide, which I think is very telling, that according to MMS with sort of the old technologies that existed in the last 20 years, it was predicted that where we are drilling now would result in 51 trillion cubic feet of gas. But the fact, as we have actually put the actuals, it is like the difference between what you have budgeted and what you actually spent, we have found our identified 380 trillion. Is that basically what I heard you say?

Mr. DAVIDSON. Yes. Yes. Between what we have produced since then plus what is still remaining, when you add up those two bars. So it is roughly five times more remaining than what we had in the original estimate.

Senator LANDRIEU. And talk a moment, if you would, about the new technologies for inventory. When you showed the slide up there that actually could show a picture under the lease tracks of what is there, what is not there, actually there was a map as to almost how you would get to it, what are some of the things that you would share with members that are either for or have not

made their mind up or might even be negative about the inventory and exploration? Can that inventory be done, at least the inventory of what might be there, without intrusive or negative environmental effects, with the new technologies, whether they be satellite or others? Could you comment for the record about that?

Mr. DAVIDSON. Yes, I would. Clearly, there can be better resource estimates made today with our technology. But it is still going to be limited. And the reason is that in really providing and developing good resource estimates, it takes a combination of some of the new seismic data that we have now. But it also takes integrating that with geological data.

And as you know, in some of these areas there have been very limited wells drilled. And as a result, as we explore, as the slide kind of noted at the top, as we explore more, we learn a lot more. I think that exploration, as we as an industry have shown, can be done in a very compatible way with the environment, not intrusive to the environment. But as we learn, it will give us a better sense as to the total resources that are there.

Generally, my experience has been, in almost basin, is they tend to grow. Because what happens is our technology builds, we go after new targets that we did not think we had seen before or were too small before, and we just increment and increment. And so as we get into a basin, we almost always tend to see the resources grow as we develop it.

Senator LANDRIEU. Well, that is a big help.

Senator Wagner, I understand there was a lot written about this subject, as you were moving this bill through with really phenomenal success and bipartisan support. And despite the veto, as you have qualified what the basic issues of that veto revolved around, what were some of the kind of comments or unexpected editorial support that you might want to add to the record?

Mr. WAGNER. Well, Senator, I really have been overwhelmed since the bill has passed of just the people that have come up to me that said, "I am glad somebody is pushing something and moving something forward." I suspected it earlier, when we did the study on the needs of manufacturers in Virginia and had a gentleman from the Gas Institute tell us initially about the 30 trillion cubic feet conservative estimate off the eastern seaboard that was available. And after that meeting, he pulled me aside. He said, "You have no idea that, you know, there is absolutely no will or no support for this."

And I told him that I felt just the opposite, that there has been a paradigm shift in this country, that it started with 9/11, and I think that has been aggravated certainly by what we have seen recently at the gas pump and what we are seeing with the utility bills, the loss of jobs. In one plant alone, Senator, we have—Honeywell is the largest user of natural gas east of the Mississippi. It is down in Hopewell, Virginia, 15 million cubic feet a day. And it has had to lay off 750 people just from the rise of natural gas at that particular plant.

People want sources. People, as I indicated earlier in my testimony, have watched our national foreign policy being dictated by our energy needs. They have tied inflation to that. And I think clearly that is an issue. Even as near as retail sales that we have

seen recently fall directly attributable to people having to make a decision, do they buy the clothes or do they pay to fill up their gas tank.

And people are looking for solutions. And I have just been overwhelmed by the amount of support that I have gotten. As I mentioned in my testimony, I thought I might be going out on a limb. And just the opposite. There have been a few naysayers, but overwhelmingly it has been a very positive support base. It has only encouraged me to push it even harder. And I am really thankful for this opportunity to come up and explain to this body that you have a lot more support out there than you think. And in fact, I really think that it is just the opposite. Americans are looking to you now. This is incredibly important to us. It cuts across all fields and all income levels. And it is absolutely imperative that we come up with some policy here.

And more and more people are wanting to look at nuclear power again as a viable alternative. And they do not understand why we are not producing more nuclear power in this country. They want cleaner coal burning and are willing to bring it online and do it. And as I mentioned, natural gas is just one solution. But it is going to take all of that to solve the energy problems we have. And I have just been overwhelmed with support.

Senator LANDRIEU. I just got a note that there is a quorum call. So I only have just a few more minutes. But I have more question, if I could try to get it in to you and then Mr. Angelle. You also, I think, represent, if I read correctly, the Virginia Beach area. And that is an area that attracts a lot of tourists and tourism. Virginia is a place where a lot of people want to go and visit and spend time on the beach.

Can you mention a minute about how that particular coastal area reacted to this and what the political response was right there on the coast?

Mr. WAGNER. And as you are aware, Senator, and you more so than everybody because of the State you represent, you understand the industry, and you understand the technical innovations that have happened and what it means to the Louisiana economy, as well as what it is perceived, as well as what the reality is in terms of the environmental threat.

When I was able to explain that in the General Assembly, every member, and there are three Senators and six delegates that represent the city of Virginia Beach in the General Assembly, every one of us voted in favor of it. Every member of the Black Caucus, Legislative Black Caucus, be it in the Senate or the House, voted for this particular measure, because so many of our African-American citizens in our area depend on the waterfront for their livelihood. They work in the shipyards, they work in the longshoreman's industry. It indeed is a regional input in our area.

And we are also experiencing defense cutbacks, particularly in the Navy in our area. And over and over we have recognized the need to be able to diversify our economy in the Hampton Roads area. And certainly supporting offshore exploration and drilling would go a long way to provide a diversification in our economy.

And so our—and even in our city council, our mayor, who objected to the legislation and asked the Governor to veto it, put in

front of our city counsel a resolution to the effect of the same thing. And I went down and basically gave an extended version of what I am giving today to the city council. And her resolution was defeated six-three. And so there is the advice of the city council here in Virginia Beach.

And so we recognize that we can have a tourism industry and we can have—we can take advantage of the offshore deposits that may be off Virginia's coast. And they can happen together. They can happen in tandem. And in the end, we will have a much stronger economy in Hampton Roads, much more diversified economy in Hampton Roads. And we feel it is a net positive. And we just want the opportunity to be able to do it.

Senator LANDRIEU. Thank you for sharing that. I think that is important, because we heard from several of our Senators about the fact that their State's economy rests on tourism. And I think it is one of the things that we want to stress in terms of the ability, if this is done correctly, for those industries to basically share the resources.

Secretary Angelle, not only are you a great leader on oil and gas, but you also are a pretty good fisherman, I hear. You have caught a few in your day.

I was given this Eco Rig's study that came out several years ago. And I remember when there was a series of articles written about it. I will just read the first sentence. "There are 4,000 offshore oil and gas platforms in the Gulf of Mexico. They produce one of the most prolific ecosystems by area on the planet." This particular report reported that 30,000 adult fish reside around the platforms in an area about half the size of a football field. Protected fish, endangered species, are either attracted to or the studies, some of them believe are actually produced by the artificial reef system that is produced by these structures in an otherwise sort of continental shelf that is filled with sand and silt coming down from our rivers.

As a fisherman yourself, I mean, do you have to read this report or could you tell us some things about fishing on the rigs in Louisiana?

Mr. ANGELLE. What I can tell you, Senator, is that one of the most difficult things to try to suggest is to actually remove these rigs once they are up, because of the structure they create. And, you know, one of the great things about Louisiana's coastal area is that it is a coastal wetland. And we have people who hunt and fish and recreate. And we have ports that are operational. I think five out of the largest ten ports in America are in coastal Louisiana.

And so we see just a tremendous merging, if you would, of a lot of different kind of activities in an area that is productive, not the fourth or fifth or sixth largest, but perhaps the largest in terms of productive ecosystems in America. And there is no question that we have found ways in Louisiana to do this in an environmentally correct way Mr. Davidson with Noble has done a tremendous job in their discovery and exploration of some of the resources in Louisiana.

So we are working in Louisiana right now on two separate fronts utilizing rigs. One is in a mari-culture type situation that the House of Representatives and the State Senate approved last year.

And second to see if we can perhaps use wind energy in the oil and gas rigs to support that infrastructure.

So there is a way for all these things to happen, we believe, simultaneously without a doubt. And we have proved it in Louisiana.

Senator LANDRIEU. Thank you.

I am down to my last 2 minutes. And I have to get to the floor for an unexpected quorum call. But I think that this has been a very productive session. I thank all of you for your patience, for coming back after lunch. Your testimony is going to be considered with a great deal of thought and care, because I will agree with all the panelists today that I think the time is for us to move an energy bill. And there are pressures that are coming to bear to see that this energy package moves.

And the offshore Outer Continental Shelf piece will be a very big piece, I think, of that energy bill, how we resolve these issues about balancing the needs of our coastal community, being sensitive to the individual States, but also mindful of the great demands that our Nation has regarding the production of energy for our economic security and our military security in the future.

Thank you all for coming. The meeting is adjourned.

[Whereupon, at 2:34 p.m., the hearing was adjourned.]

APPENDIX

RESPONSES TO ADDITIONAL QUESTIONS

RESPONSES OF ROBERT W. THRESHER TO QUESTIONS FROM SENATOR DOMENICI

Question 1. What accounts for the wide discrepancy between the current 600 megawatts of wind energy offshore and 47,000 megawatts onshore? How can we close this gap?

Answer. There are several key factors that account for the wide discrepancy between the 47,000 MW of land-based turbines and 600 MW of turbines in the water. As you know, these are global figures. The U.S. has no offshore projects operating and 6700 MW of land-based projects. The offshore wind industry began in the early 1990's in northern Europe with small projects, 2 toll turbines, driven primarily by the limited onshore wind resource. Of the 600 MW of offshore wind in Europe, about 400 MW is in Denmark. These early research, development and demonstration projects were funded primarily by the national government, with support from the European Union.

In the United States, industry and government research and development (R&D) focused on land-based technologies because of the tremendous windy land resources available in the Midwest. Land-based projects are much less costly and complex and today are nearly cost competitive with conventional fuel generation sources. In addition, 18 states and the District of Columbia have Renewable Portfolio Standards (RPS) to encourage wind development. One reason that offshore wind facilities are now being considered is that they are the most viable source for renewable energy needed to meet RPS requirements in some states, and it is not currently possible to transport large amounts of electricity from the wind-rich Midwest to the coasts, where the major load centers are located. Over 50% of the electrical load for the country is located on the coasts.

Developing an offshore turbine is much more challenging than developing an onshore turbine because of the need to design for not only the wind loads, but also wave and current loads. Another challenge is installation, which must be done at sea from ships with all of the associated weather challenges. Furthermore, maintenance is much more complicated, and access for repairs can frequently become impossible for extended periods during storms necessitating a much higher reliability for offshore turbines.

Corrosion protection is also a significant issue, particularly for the electronic components. All of these factors drive up the initial capital cost of the turbine and in order to pay for these added costs each turbine must produce more energy, which forces designers to put the largest rotor possible on the turbine in order to increase energy capture. At this point in time, offshore R&D prototype turbines are in the range of 4 to 5 MW with rotor diameters of about 100 to 120 meters and they are estimated to cost about twice as much per megawatt as an onshore turbine. Today, the energy generated by an offshore wind plant is about twice as expensive as a land-based facility.

To close the gap in cost will require a significant investment in an aggressive R&D program to overcome current water depth limits, improve accessibility and reliability, develop design methods, insure safety, and establish environmental baselines and standards, as well as demonstrate the technology through testing and operational experience. Due to these challenges, developing offshore wind technology capable of cost-effectively harnessing a substantial portion of the Nation's offshore wind resource base will take at least a decade of research, development and demonstration, funded at about the same level as the program for land based turbines. More funding could accelerate the development and less would stretch it out. To put this in perspective, current estimates indicate that a single offshore R&D prototype turbine for shallow water will cost about \$50M to design, fabricate, install and fully test.

The government role should also include support for research on environmental issues to establish environmental baselines and standards to determine possible usage benefits and impacts. There is a need for hard scientific data to environmentally baseline the most likely regions where wind energy facilities are to be built. This could include the development of regional programmatic environmental assessments that map the many uses of a region, screening the areas with criteria to protect sensitive environmental areas (exclusion zones), and mitigate potential competing uses of the ocean area. An important and difficult issue that will need to be addressed is the impact of cumulative effects on the outer continental shelf. This requires consideration of the impacts due to all activities, including oil and gas production, wind, wave, tidal, and current energy facilities, as well as all other activities. It is essential to consolidate the leadership for this important environmental work and permitting at a single federal agency that can permit offshore ocean renewable energy facilities in a timely fashion at a reasonable cost.

The ultimate vision for offshore wind technology is a floating platform system that will be mass produced and assembled in a local dry dock facility, towed out to sea, anchored, and plugged into the electrical connector to an undersea cable that delivers the power to shore. Through economies of scale and mass production at local U.S. shipyards, work at sea would be minimized, high paying manufacturing jobs would be created, and competitive energy costs could be achieved.

Question 2. Why have no offshore turbines been installed in waters deeper than 20 meters?

Answer. The European offshore wind industry has been fortunate to have an abundance of shallow water sites (less than 20 meters) for deployment of all of their offshore wind power facilities installed to date. The cost and complexity of an offshore wind generating facility increase with water depth. Two critical factors limit today's technology to water depths of 20 meters or less. First, currently the turbines are supported on the seafloor by a simple tube structure, which is driven into the sea bottom. This type of support is too flexible to withstand the wave loading in water deeper than about 30 meters. The second reason is that the ships used to drive these monopoles into the bottom cannot operate in deeper water. Research and development is needed to adapt the technology used by the oil and gas industry for offshore wind turbines in depths of 30 meters and beyond. This includes truss structures for use at intermediate depths of about 30 to 60 meters, and floating wind turbine platforms (similar to floating oil platforms) for water depths above 60 meters. The R&D challenges must focus on minimizing the cost of these supporting structures. Offshore wind facilities must have a much lower capital and operating cost than an oil production platform in order to be cost effective.

Question 3. If administrative problems get worked out and technology allows access to deep waters on the OCS, what is the best-case scenario for the amount of wind energy production that you envision?

Answer. Current projections using the National Energy Modeling System (NEMS) developed by the Energy Information Administration (EIA) show that wind energy could provide up to 70 GW on the national electric grid by 2025, assuming an aggressive R&D program. This projection is based on no additional government sponsored incentives (e.g. production tax credit, carbon credit). The very crude estimates that have been made to date indicate that in the zone from 5 to 50 miles off the coast there is sufficient resource for up to 900 GW of installed wind capacity, a figure based on exclusion of about 40% of this area from development. It is extremely unlikely that all of this remaining area would be developed; however, it does show the resource base is large. Without storage, and assuming today's electrical grid, a practical "best-case" scenario for wind is about 30% of the electricity supply for the nation, including both onshore and offshore generating facilities. Today, we get less than 1/2% of our nation's electricity from wind. Currently, Denmark is generating about 20% of its electricity using wind, and they have a national goal of supplying 50% of their electricity using wind, with the majority coming from offshore installations.

Question 4. With respect to wave energy technology, you assert in your written testimony that, "the current status of development for wave technology is roughly where wind energy was twenty-five years ago."

What can we do to ensure that wave energy on the OCS is not bogged down with the same types of problems, so that twenty-five years from now we do not say (as you say about wind technology today) that we have no direct experience or infrastructure?

Answer. To ensure that wave energy technology, as well as other potentially viable fluid-dynamic forms of ocean energy—tidal and current technologies, are developed in a timely and cost effective manner, the following steps should be taken.

First and foremost, authorize and fund an ocean wave, tidal, and current energy research, development and demonstration program to work in partnership with the nation's embryonic ocean renewable energy industry to evolve the technologies and make them reliable and cost effective. This can best be accomplished by developing design methods, ensuring safety, establishing environmental baselines for offshore ocean renewable energy facilities, and setting standards, as well as demonstrating technologies through testing and operational demonstrations. As part of this R&D program, a federal test site should be identified that is permitted to allow testing of single experimental units, as well as small demonstration projects without the cost and time consuming effort of a project-by-project environmental assessment, as is currently required.

The R&D should assess and estimate the ocean wave, tidal, and current energy resource potential of the nation by region, and at the same time perform an offshore environmental inventory in collaboration with appropriate federal and state government agencies and environmental stakeholders. This should be done to understand the highest potential regions for early deployment of demonstration generating facilities, while assuring minimal negative environmental impacts.

An important and difficult issue that will need to be addressed is the impact of cumulative effects on the outer continental shelf. This requires consideration of the impacts due to all activities, including oil and gas production, ocean renewable energy facilities, as well as all other activities. It is essential to consolidate the leadership for this important environmental work and permitting at a single federal agency.

The R&D effort should investigate approaches for integrating large offshore electrical generation facilities with variable output into the nation's electrical transmission system at minimal costs and with minimal impact on the system's operation and stability. Additional study and experimentation is needed to optimize integration of fluctuating generating system output in the electrical system.

There are a number of economic and knowledge enhancing benefits that could be realized by a combined ocean renewable energy program. On the technical side, both wind and water-based renewable technologies are machines that operate at high torque and low speed. They must both operate in the same offshore ocean conditions and they will have similar interactions with marine flora, fauna and the seafloor. Consolidating all of this R&D effort in one organization would greatly accelerate learning, and would prevent a duplication of efforts.

The development and use of wave, tidal, and current technologies can be accelerated by participating in international partnerships. The Europeans have been actively developing these technologies for several years and have developed several prototype ocean renewable energy electrical generators. In particular, the United Kingdom has an aggressive R&D program in wave, tidal, and current energy, and they have just opened the European Marine Energy Center on the Island of Orkney in Scotland. We could greatly accelerate this nation's rate of knowledge and development of ocean renewable energy technologies in a very cost effective fashion by authorizing and funding multilateral and bilateral cooperative research projects with European countries active in this research. These collaborations could include: participating in the TEA Ocean Energy Systems Agreement, scientist exchange programs, as well as joint funding of high value fundamental research and testing programs.

RESPONSES OF ROBERT W. THRESHER TO QUESTIONS FROM SENATOR BINGAMAN

Question 1. Do you have suggestions on how renewable energy facilities can be sited to minimize local impacts? What infrastructure is necessary for the facilities associated with the different types of energy development contemplated on the OCS?
Answer.

SITING SUGGESTIONS

Ocean renewable energy facilities are made up of arrays of machines that are structurally supported from the seabed or, if they are on floating platforms, moored to the seabed using anchors and cables. To deliver the electricity to shore a cable is trenching into the seabed, or laid on top of the seabed, depending on the site conditions. The primary interaction with marine flora, fauna and seafloor is through direct contact. Marine animals interact with the structure below the surface and the cable to shore, while birds interact with the surface structures and with the moving rotor of wind turbines.

An important step that could be taken to vastly improve siting and reduce impacts would be to establish environmental baselines and standards now, before facilities are actually built. There is a need for hard scientific data to environmentally

baseline the most likely regions where wind and wave energy facilities are to be built. This could include the development of regional programmatic environmental statements (PEIS under the National Environmental Policy Act—NEPA) that maps the many uses of a region, screening the areas with criteria to protect sensitive environmental areas, and mitigate potential competing uses of the ocean area. Developing such overlay maps and an environmental inventory of wildlife and commercial uses for a regions would provide guidance to both the environmental community and energy developers on the important issues to be addressed when siting energy production facilities.

Starting such a process under NEPA would also initiate a formal public involvement process that identifies alternatives and potential environmental problems. This procedure may streamline the permitting process in the in the long run. Without such a strategic approach, the federal and state governments will need to require environmental assessments for each and every project. Developers will most likely be asked to fund before-and after, construction impacts (BACI) environmental studies to identify and verify the scope and intensity of impacts to the permitting agency and third party stakeholders. The PEIS process described above will help limit and focus the BACI type studies to those that are really needed.

Another important and difficult issue that will need to be addressed is the impact of cumulative effects on the outer continental shelf. This requires consideration of the impacts due to all activities, including oil and gas production, ocean renewable energy facilities, as well as all other activities. For this reason, it is essential to consolidate the leadership for this important environmental work and permitting at a single federal agency that can permit offshore wind energy and wave energy facilities in a timely fashion at a reasonable cost.

NECESSARY INFRASTRUCTURE

Regional facilities will be needed to mass-produce hundreds, if not thousands, of wind, wave, tidal, and current machines. The devices will then most likely be transported by ship or towed to a specific sea station and installed. There will be a need for specialized installation equipment and vessels specifically designed for installing ocean renewable energy devices. The operation and maintenance will also be done from local shipyards harboring work boats of various types, and probably a jack-up, barge-mounted crane. Some maintenance activities may also be done by helicopter. For a large wind facility, several crews will do scheduled and unscheduled maintenance on a daily basis working from machine to machine as their work progresses.

In the future, if ocean renewable energy facilities grow to cover a large portion of the electrical load in a region, then an offshore, high capacity transmission cable may be necessary to connect several offshore generating facilities to various substations on shore. This would alleviate transmission congestion onshore, and would provide multiple injection points for the offshore electrical energy over the region. In Europe, a high capacity offshore cable is being discussed to facilitate the interconnection of many wind farms in the Baltic Sea. This would provide multiple injection points for the wind generated electricity across several countries, without making major upgrades to the entire onshore transmission grid.

STATE OF VIRGINIA,
7TH DISTRICT,
Virginia Beach, VA, May 11, 2005.

Hon. PETE V. DOMENICI,
Chairman, Committee on Energy and Natural Resources, U.S. Senate, Washington, DC.

DEAR SENATOR DOMENICI: Thank you for inviting me to testify before the Senate Energy and Natural Resources Committee on April 19, 2005 regarding natural gas exploration and drilling off the coast of Virginia. Enclosed, you will find my answers to the list of questions I received to expand on some aspects of my testimony.

I am sorry that the schedule did not permit me to testify before you on the subject. I will add that Senator Landrieu did a fine job of continuing the meeting in your absence. However, I regret that we did not have an opportunity to personally chat about the natural gas issue. I would be delighted to meet with you any time your schedule permits if you would find such a discussion valuable. I can be reached at my legislative by calling 757.671.2250 or my business office by calling 757.247.0101.

Again, I thank you for allowing me to share my views on this extremely important issue. I look forward to hearing from you.

With kindest regards, I remain
Very truly yours,

FRANK W. WAGNER,
State Senator.

[Enclosure.]

Question 1. Senator Wagner, your bill would have allowed the Virginia Liaison Office to lobby Congress on behalf of legislation that would lift the moratorium for development of natural gas reserves off the Atlantic Seaboard. What do you view as the most important principles to be incorporated into legislation that seeks to increase production and exploration on the OCS?

Having witnessed the Energy and Natural Resources Committee members' testimony prior to the hearings, particularly the comments from Senator Martinez and Senator Burr, I believe that the most prudent course of action would be to allow states to opt out of the current moratorium on the OCS. The state and its people—who are closest to any exploration area—should be permitted to decide the issue of exploration. If Virginians believe that exploration off their coast is in their best interest, then it will be Virginians who decide to welcome or not to welcome exploration for natural gas.

Also, I believe shared royalties with the states that choose to opt out of the moratorium is altogether appropriate and will act as a powerful incentive for states to seriously consider the risk/reward nature of drilling in the OCS and will also recognize that although production may occur in federal waters, the adjacent state will have a role to play in providing onshore infrastructure to support that activity. I believe once state governments study the safety and environmental records of the offshore industry, they will come to the same conclusion the Virginia General Assembly did in February 2005. The conclusion is that it is in the best interests of Virginia to pursue our offshore energy assets.

Therefore the two major provisions for OCS energy recovery should be:

1. Opt out of the moratorium by Executive Order from the Governor or by act of that state's legislative body.
2. Shared royalty payments with only the states that choose to lift the moratorium.

A third provision I consider extremely important to developing a plan to harness the full resources of the OCS, is an intensified Research and Development effort on methane hydrates with a goal of developing processes to economically harvest this important new potential resource. Alan Greenspan echoed these comments during his recent testimony in front of Congress.

Initial USGS surveys suggest that two small areas, less than the size of Rhode Island, contained ten times more natural gas locked in these hydrates than was consumed in 1989. One report I read stated that there was twice the amount of carbon-based fuel reserves locked in methane hydrates than in all of the remaining carbon-based reserves (oil, natural gas and coal) combined. If we can put a man on the moon and an SUV on Mars, we can figure this one out, too.

Question 2. You say that Canada is presently recovering over 500 million cubic feet of natural gas per day off Nova Scotia. What do you think accounts for the differences in policy between U.S. and Canada?

It is clear that Canada has a far more aggressive approach to fulfilling their energy needs than we do in the United States. Various reports and press accounts indicate that Canadian policy makers have looked at the outstanding safety and environmental record of the offshore energy industry and concluded that it is altogether appropriate to recover Canadian reserves off their coastline. The safety record speaks for itself: it is environmentally sound to pursue domestic reserves.

I also believe Canadian policy makers have determined that it makes far more sense to employ Canadians to recover Canadian resources to be used by Canadian industries and homes (and exported to the U.S.) than it does to spend Canadian dollars to import their energy sources from countries that may or may not be friends of Canada.

Question 3. Please give me your thoughts on what you believe are the major distinctions, if any, that should be made between seeking additional access to resources for exploration and production of oil and seeking additional access for the exploration and production of natural gas?

Reports I have read from the Department of the Interior indicate that the Atlantic OCS is gas prone, with little evidence of oil off the mid-Atlantic coast. However, there is always the possibility that where natural gas is discovered, there may also

be oil. The fact that there has not been a major oil spill from over 4,000 oil and gas platforms in 35 years would suggest that there is no scientific basis for making a distinction between oil and gas.

Therefore, I believe that the moratorium should remain in place out to 20 miles off the shoreline for deposits made up of primarily natural gas and 40 miles offshore for deposits made up primarily of oil. Beyond 20 and 40 miles, I believe the individual states should decide whether or not to lift the moratorium on the remaining OCS.

Question 4. What impact would OCS access off of the Virginia coast have on jobs in the state and natural gas prices in Virginia?

Answer.

JOB GROWTH

It has always been my contention that OCS access off the coast of Virginia would have a very positive effect on Virginia's economy and job growth.

Job growth would increase by three measurable standards:

1. Direct employment in supporting OCS surveying, drilling and recovery of OCS energy reserves.
2. Increased manufacturing employment due to a stable source of a domestic supply of natural gas at a reasonable cost.
3. Indirect service sector job growth associated with the expanding economy in the OCS manufacturing sector.

By way of explanation, actual economic data collected in Nova Scotia and in Norway proves the economic stimulus that occurs when supporting OCS exploration and development. A languishing Nova Scotia economy was actually turned around because of the investments that major energy companies made to support offshore exploration and recovery of natural gas.

In terms of manufacturing jobs, the Honeywell plant in Hopewell, Virginia (largest user of natural gas east of the Mississippi) has laid off over 750 Virginians due to the threefold increase in natural gas prices in the past five years. This factory is one of the United States' major producers of fertilizer and nylon. Logic dictates that a reduction in natural gas prices will result in an increase in employment at this one factory.

However, natural gas is a key component in a variety of manufacturing processes, including national security related chemical businesses, as well as the paper and pulp industry and those processes involving heat treating. As long as U.S. natural gas prices remain the *highest* in the world, we will continue to see our industrial and manufacturing base erode.

NATURAL GAS PRICES

With regards to natural gas prices in Virginia, our offshore production would be piped into the existing natural gas distribution infrastructure. Since natural gas is traded as a commodity, market forces dictate the actual cost of gas.

To the extent Virginia would benefit over any other state, our close proximity to the source may result in a lower distribution cost.

However, the entire country would benefit from every effort we make to enhance the natural gas supply. Energy commodities have a direct relation to supply/demand market forces; hence, any increase in supply (OCS resources, Alaskan gas pipeline, additional LNG offload facilities) can only result in stabilizing and hopefully reducing natural gas costs.

To do nothing would have a disastrous effect on our manufacturing base and household consumers and have serious implications for our national economy.

Question 5. Please comment on the environmental impact of what you propose.

The environmental risks associated with offshore drilling are minimal. As stated by the Secretary of the Interior, "There has not been a major spill from an offshore oil platform in 35 years."

This track record is directly attributable to the safety features and technology enhancements incorporated into today's modern offshore drilling platform. When one compares the environmental safety record of the offshore drilling industry versus oil tankers and barges, it is obvious that the offshore industry is by far the preferred option if one is solely concerned with minimizing environmental risk. It also stands to reason that if we do not increase our domestic production, then we will be required to increase the tanker traffic and the inherent environmental risk associated with increased traffic.

No one is proposing a moratorium on tanker traffic for obvious economic and national security reasons. However, environmental scare tactics ring hollow when one

studies the actual data. Not only are the environmental risks minimal, I encourage everyone to visit this website: www.towersoflife.com. I have taken the liberty of including the following information from the website and I ask you to read it carefully.

"There are approximately 4,000 offshore oil and gas platforms in the Gulf of Mexico. They produce one of the most prolific ecosystems, by area, on the planet. Stanley and Wilson (2000) reported that 10,000-30,000 adult fish reside around the platform in an area about half the size of a football field. Live rock organisms, coral, Endangered Species, and 'protected' fish and invertebrates colonize the platform's submerged structure. Many blue-water platforms create complex coral reef ecosystems, comprised of Caribbean flora and fauna that would otherwise not exist on thousands of square miles of generally featureless and silty continental shelf. These platforms clearly produce fish rather than merely attract fish. An abundance of evidence suggests that they are Essential Fish Habitat (EFH), Coral Habitat, and Endanger Species Habitat (ESH). Over 50 species of federally managed fish, crustaceans, and live rock organisms settle and forage around the offshore structures. The ecosystems they create are not designated as 'protected habitat' under any of our current Fisheries Management Plans. Over 100 of them will be removed every year for the next 40 years." www.towersoflife.com/ecorigs/index.html

Like most citizens in our country, I want to enhance the quality of our environment. However, the environmental threats from offshore drilling espoused by some, do not jibe with the facts or the demonstrated 35-year record.

As a former Navy diver and still active sport diver, I have seen with my own eyes literally thousands of fish congregating around the Chesapeake Bay light tower. Once erected, offshore towers become an ecosystem.

Therefore, I have concluded that, based on an increase in tanker traffic or offshore development of our resources, offshore development is preferable. Based on a 35-year track record of no major spills, I believe that the environmental risks are minimal compared to the potential reward. Furthermore, we have talked about oil and gas platforms. The Department of the Interior has only stated a conservative estimate of 30 trillion cubic feet of natural gas and no mention of oil. Natural gas, since it is a gas, cannot spill.

In closing, platforms established in the Atlantic basin will become ecosystems. Collected data from existing platforms proves that these platforms, and from 10-18 miles out from them, become new ecosystems. Rather than scaring off tourists, I believe the very real possibility exists that tourism will be enhanced because of new fishing areas that will be created. I visited a local bait store to gauge the sport fishermen's reaction after my legislation had become big news here in Hampton Roads. To a person, they responded positively. They supported my legislation because they understood the potential for new fishing opportunities.

Responses to the following questions were not received at the time the hearing went to press.

QUESTIONS TO MS. BURTON FROM SENATOR DOMENICI

Question 1. If the strongest trend on the OCS today is the continuing development of the deep water in the Gulf of Mexico and the deepwater is primarily oil rich (or more oil-rich than shallow waters), how can we increase or even just sustain our level of natural gas production on the offshore?

Question 2. Please comment on what steps MMS is taking to ensure that OCS operators are complying with applicable environmental laws?

Question 3. What do you think of the principle that each individual coastal state should have the choice of whether or not oil and gas is produced off of its coast?

Question 4. Can you give us your thoughts on how effective the offshore oil and gas industry is at preventing oil spills?

Question 5. What facts lead you to conclude that MMS has the capability and is the most appropriate agency to administer offshore renewable energy projects?

QUESTIONS TO ADMIRAL WATKINS FROM SENATOR DOMENICI

Question 1. In your written testimony you state that, the nation's vast offshore ocean areas are, "becoming an increasingly appealing place to pursue economic activities." Do you believe that it is time for us to re-examine whether increased access

on the OCS for entities to pursue economic activity would be beneficial to the nation?

Question 2. How can the federal government best facilitate renewable projects on the OCS and alter the current scheme which the Commission viewed as ineffective?

Question 3. In your written testimony, you state that oil and gas development is a classic example of "multiple-use resource management, including federal-state tensions."

What specific steps can be taken to fairly and equitably deal with this tension, particularly with regard to changes to the current revenue structure?

Question 4. With respect to methane hydrates, it is the view of your Commission that much more information is needed to determine whether significant technical obstacles can be overcome to enable methane hydrates to become commercially viable and environmentally acceptable.

Please comment on what some of these obstacles are and what is being done to overcome them.

QUESTIONS TO ADMIRAL WATKINS FROM SENATOR BINGAMAN

We are all well-aware of the controversy associated with the OCS oil and gas leasing program that has resulted in moratoria on large areas of the OCS. Now some are looking at the possibility of trying to tap the considerable non-oil and gas energy potential on the OCS.

Question 1a. What do you think are the lessons learned from the oil and gas OCS experience that we can apply as we move forward with other energy production on the OCS?

Question 1b. Can we avoid the "not in my backyard" syndrome as we move to develop renewable resources on the OCS? How?

Question 1c. Do you have any other suggestions on how we can minimize the controversy associated with non-oil and gas energy development on the OCS?

Question 2. Have you had an opportunity to review section 321 of the Conference Report on H.R. 6 (108th Congress) relating to alternate energy-related uses on the OCS? Do you have suggestions on any modifications to the provision to make it more consistent with the recommendations contained in the Ocean Commission Report? If so, please provide them.

Question 3. The Ocean Commission Report calls for a comprehensive management regime for renewable energy on the OCS. Your testimony outlines several shortcomings of the current statutory authorities of the Corps of Engineers and the FERC in this area. Please elaborate. Given the current responsibilities of MMS for offshore energy development, do you think the Secretary of the Interior should take the lead in this area?

Question 4. Your statement discusses the need for a "comprehensive offshore management regime" to coordinate the multiple uses of the Outer Continental Shelf. What do you envision? Please elaborate.

Question 5. Your testimony recommends a funding increase in MMS's environmental studies program. Do you think this is necessary to address concerns where production is currently taking place? Do you think an increased commitment to addressing environmental concerns is a precursor to allowing energy production to go forward in other areas?

QUESTIONS TO MS. BURTON FROM SENATOR BINGAMAN

We are all well-aware of the controversy associated with the OCS oil and gas leasing program that has resulted in moratoria on large areas of the OCS. Now some are looking at the possibility of trying to tap the considerable non-oil and gas energy potential on the OCS.

Question 1a. What do you think are the lessons learned from the oil and gas OCS experience that we can apply as we move forward with other energy production on the OCS?

Question 1b. Can we avoid the "not in my backyard" syndrome as we move to develop renewable resources on the OCS? How?

Question 1c. Do you have any suggestions on how we can minimize the controversy associated with non-oil and gas energy development on the OCS?

Question 2. During the 107th Congress, the Administration transmitted legislation to provide a statutory regime for permitting the development of alternate energy related uses on the OCS. I agree that comprehensive legislation is needed in this area, and that it makes sense to give the Secretary of the Interior authority to permit this type of activity on the OCS.

I believe some aspects of the Administration's proposal need fine-tuning to clarify the scope of the provision and also to clarify that certain requirements of the OCS Lands Act apply. Will you work with us to refine these provisions?

Question 3. Senator Alexander has introduced a bill (S. 726) that would require that portions of the original Lease Sale 181 area be offered for lease. Do you support this provision?

Question 4. Has any decision been made yet on whether to include any portion of the original area of Lease Sale 181 in the next Five-Year Plan?

Question 5. What are MMS's current resource estimates for the OCS? Can you explain the methodology used in developing these estimates?

